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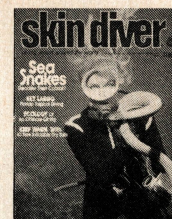
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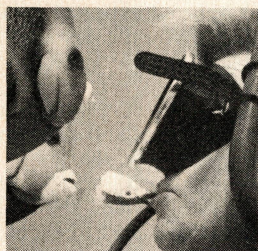


# skin diver

VOLUME TWENTY-FOUR NUMBER TEN



32/Hilda Inhabitant



58/Largo Show



46/Snake Charmer

## FEATURES

### INDUSTRY NEWS

- 20** HEALTHWAYS • NANCY ACKERMAN  
*Diving Industry Pioneers*

### EQUIPMENT

- 22** AMF SWIMASTER'S 3SL20 UNDERWATER STROBE • JACK MCKENNEY  
*An Exclusive SDM Product Report*

- 26** INFLATABLE DRY SUITS • JACK MCKENNEY  
*Diver Exposure Wear Enters a New Era*

### CONSERVATION

- 32** HILDA • HILLARY HAUSER  
*An Oasis in the Sea*

### PERSONALITIES

- 40** PAPA TOPSIDE • BILL BARADA  
*Dr. George F. Bond—the Father of Saturation Diving*

### OCEAN GALLERY

- 46** SEA SNAKES • VALERIE TAYLOR  
*Serpents in the Garden of Eden*

### WRECK DIVING

- 50** MYSTERY WRECK AT 33 FATHOMS • TOM ROACH  
*The Identification of New Jersey's Mud Hole Wreck, the Junior*

### MARINE LIFE

- 54** ANGELS OF THE SEA • CARL ROESSLER  
*Fishwatchers' Favorite Family*

### TRAVEL

- 58** KEY LARGO • PAUL TZIMOULIS  
*Home of John Pennekamp Coral Reef State Park*

### DEPARTMENTS

- |                |                      |                   |
|----------------|----------------------|-------------------|
| 7 DRIFTWOOD    | 48 FISH OF THE MONTH | 74 DIVE TOUR NEWS |
| 14 INSTRUCTION | 56 NEWS BRIEFS       | 80 BIO BRIEFS     |
| 19 SCUBA EXAM  |                      | 90 CALENDAR       |

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Cover—Author, Valerie Taylor, of this issue's article on page 46, Sea Snakes, is shown holding one of the subjects of that feature. The photographer, Valerie's husband, Ron, took the picture on the Great Barrier Reef in the Coral Sea, off Australia.

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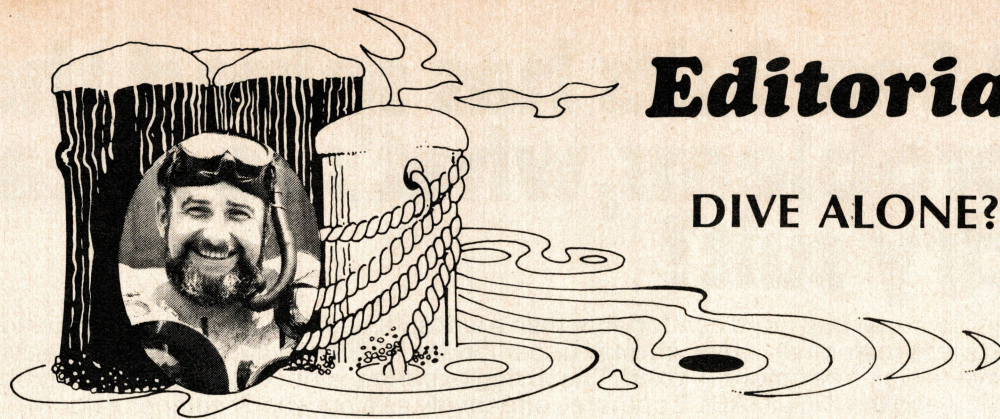
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# Editorial

## DIVE ALONE?

by the Publisher

**F**rom the very start of his scuba class, the student is instructed to never dive alone. His buddy diver is supposed to be a combination of amiable companion, diver tender, lifeguard, and early warning system in times of peril or emergency. This interdependence among dive partners becomes deeply seated in the novice diver's mind and further, often becomes a permanent part of his underwater survival instinct.

And this may very well be the correct and proper approach toward diver safety, except for one thing — the diving buddy receives little instruction as to how he is supposed to save his partner's life. Quite often a well meant attempt at underwater assistance resulted in total confusion and chaos.

This subtle deficiency in current scuba training methods is beginning to come home to roost. According to an L.A. County Underwater Safety Committee report, "A Study of Southern California Scuba & Free Diving Fatalities," 21% of the fatalities studied involved a buddy diver attempting to give assistance to his partner. Among these, there were two cases of double drownings, where the difficulties of one diver resulted in the demise of both he and his partner. Ralph Singer, accident researcher and author of the report, commented that the location and position of the victims tended to indicate an attempted rescue which led to a panic situation. In nine other cases, the surviving buddy reported he was nearly drowned which attempting to assist the victim. At least two of the accidents occurred while buddy breathing.

This trend toward double trouble is further corroborated by evidence presented in the University of Rhode Island's 1970 diving fatality report. At least 19 cases involved one diver attempting to assist his buddy, and there were a total of four double death incidents. Although a double drowning is well within the range of accident possibility, current percentages of frequency are thought to be abnormally high. According to the URI researchers, "We suspect over the years the buddy system has been given a great deal of lip service but relatively little careful study."

The revelation of these statistics stirred

a great deal of concern among scuba instructors, and in many cases has divided them into two separate camps. One group of instructors is advocating abandonment of the buddy system as a primary safety rule, claiming it only builds a false sense of security. They prefer to emphasize the development of a stronger degree of self-reliance, the use of bailout bottles, and other diver safety equipment. They are convinced that the diving buddy may be more of a hazard than a help.

The other group (the majority) of instructors staunchly defends the buddy system and blames the double deaths on poor training. They point to the hundreds of successful underwater rescues which can be directly attributed to the buddy system and buddy breathing. "Don't condemn the system, make it better," is their rebuttal.

It is this writer's opinion that the buddy system is basically a good system, but certainly needs to be improved. A review of the current scuba training textbooks very quickly reveals a serious deficiency. Most manuals devote no more than a few paragraphs to such important subjects as buddy breathing; underwater rescues, or underwater first aid. Detailed instruction of the safety of the system is virtually non-existent.

For example, let's examine the current training method for buddy breathing. Most manuals treat the subject superficially, explaining briefly the procedure and position for trading the regulator mouthpiece back and forth. Yet none of the textbooks give any advice on when and when not to commence buddy breathing. None of the manuals instruct the reader to check his buddy's eyes for signs of uncontrollable panic. None of the books caution the diver about a frontal approach to a panicked, thrashing diver who may very well drag his buddy down with him — a fact which is greatly emphasized in lifeguard training. Only the Navy Diving Manual states that a diver in trouble should never grab or take away his buddy's regulator, but should only take it when offered. It is more than likely that the diving buddy may also be running out of air, resulting in two divers fighting over a regulator which is at-

tached to an empty tank. The decision as to whether to buddy breathe or make a free swimming emergency ascent cannot be left to chance — it must be preplanned at the time when the student is receiving his initial instruction. Every detail and alternative should be spelled out and then practiced in the water.

And while we're on the subject, how about the water portion of buddy breathing training? Most students receive only limited, superficial type training. They start buddy breathing in the shallow end of the pool and then move to the deep end for one or two practice sessions during subsequent lessons. If the student is lucky enough to have a really thorough instructor, they might get another practice session at 20 or 30 feet during their final open water checkout. Almost never is a student trained and practiced in actual buddy breathing ascents — the pool is generally too shallow to effectively simulate this condition and the open water checkout is too brief for survival training. Seldom is a student told to periodically practice buddy breathing after he graduates from scuba class. Although buddy breathing requires a certain degree of skill, coordination and timing, the diver may never again practice this emergency procedure until his buddy runs out of air at 100 feet two years later. No wonder there is fumbling and confusion! Wouldn't it be far safer for instructors to encourage buddy breathing practice on a regular basis? The time I find most convenient for such practice is while hanging off on the anchor line during the 10 ft. decompression stop (simulated or otherwise). Repeated practice is the only certain preparation for an emergency, panic prone situation.

Above all, a detailed procedure (and alternatives) must be established for buddy breathing assistance. When is it not feasible to attempt buddy breathing? How should you approach a panicked diver? How should you buddy breathe with an unconscious diver? These are a few of the questions which need immediate answers.

Isn't it time we start telling new divers how to cope with an underwater emergency instead of just telling them how to avoid one? >

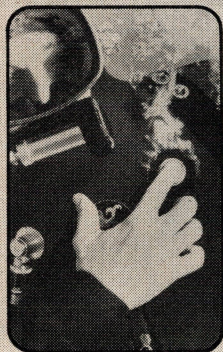


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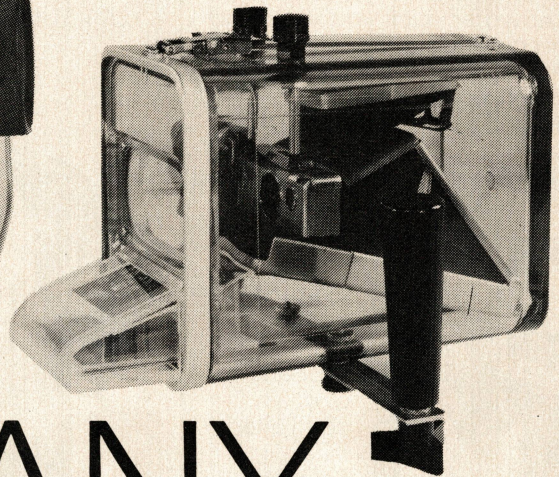
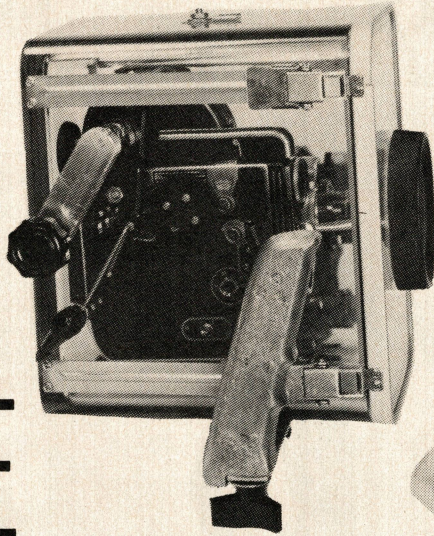
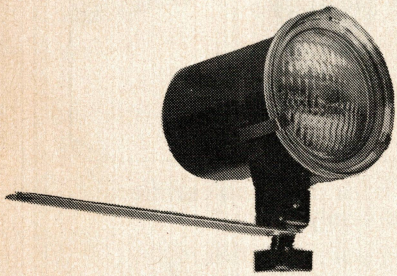


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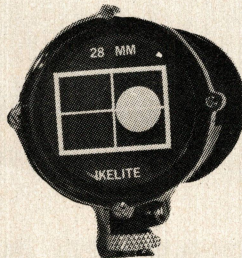
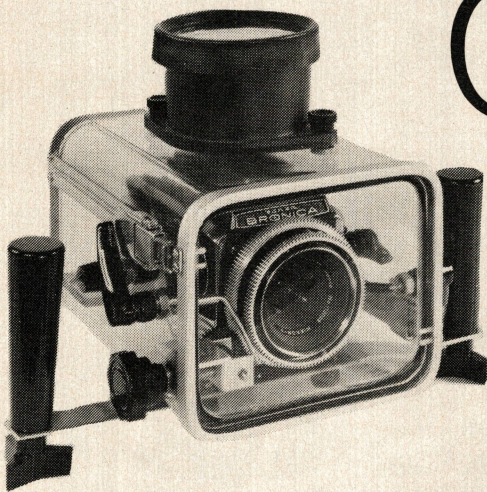
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... I just wish to write a note of defense in behalf of the shark.

I have noticed that since the release of the recent movie, *Jaws*, several articles about sharks have begun appearing in the newspapers covering such items as shark fishing contests, attacks, etc.

So much attention has been given lately to the shark being a mindless, savage, and wanton murderer of all living things that if not careful, we may begin seeing numbers of citizens taking to the waters of the seas to rid society of this "plague of mankind and the sea."

Sharks mainly live by feeding upon the weak and injured fish and animals that live in the seas, and I believe this is God's way of insuring that only the highest quality of fish and animals inhabit the sea to eventually be used by other sea animals, fish, and mankind.

In any other area of nature, the removal of natural predators allows weak and near useless animals to breed and reproduce animals of even less quality than its inferior parents, eventually, should the chain continue, becoming a major factor that could cause the end of a particular species.

I am at once awed, intrigued, fascinated, and at times terrified by members of the shark family, but let us not allow unreasoned fear caused by a few isolated statistics cause such tragedies as mass shark extermination efforts I hear more and more talk of lately, and which eventually could tip the delicate balance of our ocean environment ever so slightly too far in any one direction, by this attempted removal of the shark, a very important member of the ocean world, which could have disastrous consequences on the future of us all ...

RUSTY SMITH AMARILLO, TEXAS

... As a diving instructor and member of the Bay State Council of Divers I am very concerned over the present legislative actions taking place in California. Our own New England legislators are taking a long look at the Los Angeles County Ordinance at this writing. Our sport is in danger!

This legislation on diving is spreading like cancer throughout our area from state to state and we divers in Massachusetts have formed our own lobbying agency to monitor this, but we want to be in touch with other concerned councils to discuss the past, present, and most important — the future of diving.

To get in touch with these organizations we need your help. We are planning a meeting of all interested parties to take place this coming April and would

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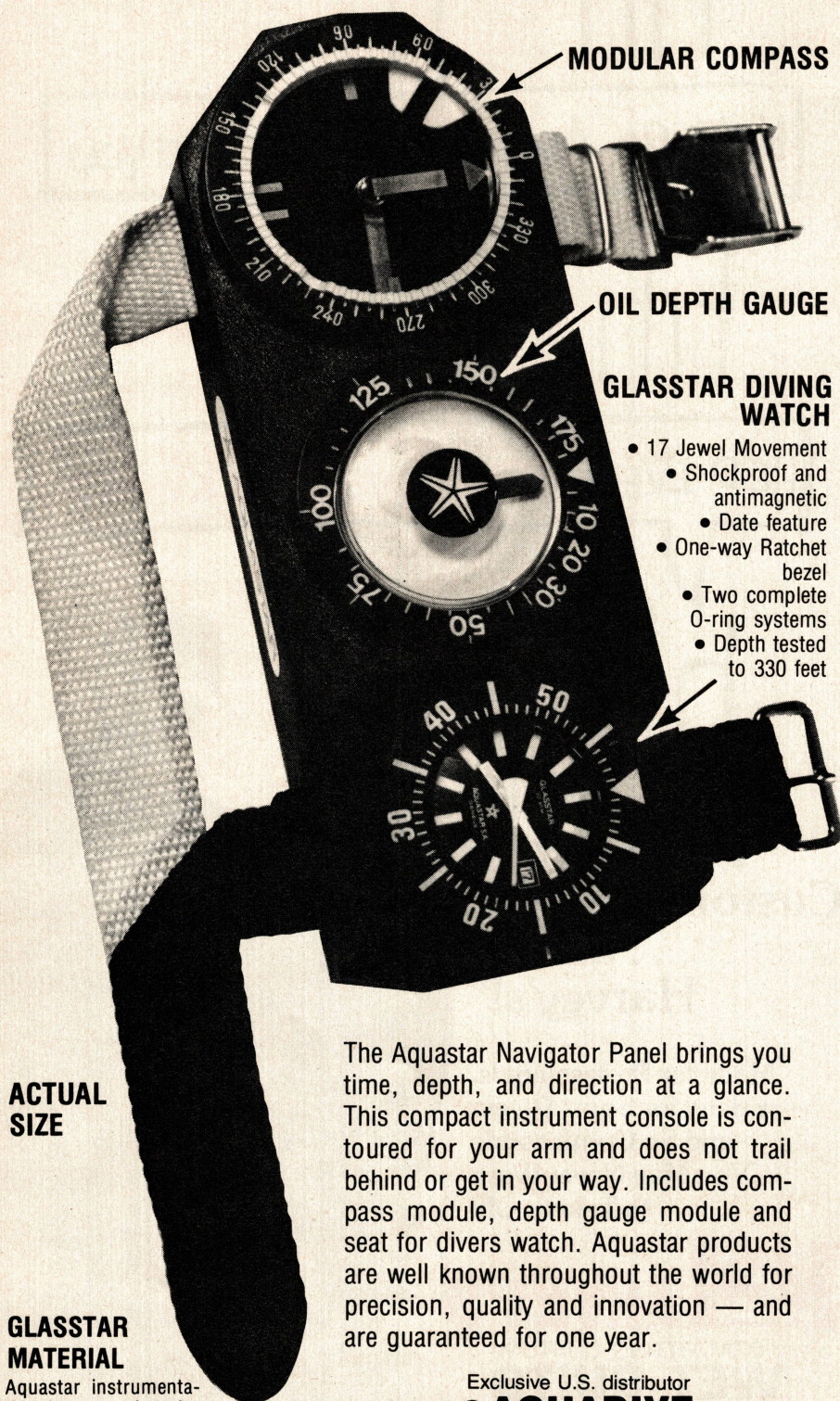
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WAYNE ANDERSON HYANNIS, MASS.

*The date included in the letter for the North Atlantic Diving Council's Convention at Harvard University, Boston, Massachusetts, is April 2, 1976. For any inquiries or further information, contact Wayne Anderson at P.O. Box 908, Hyannis, Mass. 02601.*

... After buying some plexiglass-cased diving equipment, it occurred to me to use cobalt chloride paper to detect any leaks in the casing before it becomes serious enough to damage equipment. To make this paper, a solution of cobalt chloride is painted on a piece of white paper or cloth. When dry, the paper is light blue in color. If the paper gets wet, or is even exposed to humid air, the color changes to a reddish pink. This paper, when placed inside the casing, will efficiently show the slightest dampness in the case.

To make a cobalt chloride solution, mix ½ teaspoon of cobalt chloride — available at your drug store or hobby shop — with ¼ inch of water in the bottom of a glass. Simply paint this solution thoroughly and evenly on the white paper or cloth to fit your apparatus ...

JERRY LEONARD  
 FORT MCMURRAY, ALBERTA

... Several times of late SKIN DIVER has mentioned the Bermuda Triangle or similar subjects, by which I gather that you, or someone on your staff, is interested in such matters. As you probably know, Dmitri Ribikoff once mentioned that the search for possible evidence of extraterrestrial contacts — call it "exoarchaeology," if you wish — one of the most fascinating opportunities facing underwater exploration. Here would indeed seem to be a unique challenge for the diver. Would you know of any organization of divers engaged in such research, preferably on a serious rather than a sensational level? If so, I would be interested to know where one might contact them ...

JAMES POWELL, JR. PLAINVIEW, TX.  
*We don't know of one, offhand, but would be happy to contact you if we are notified of one.*

... I read your article on the floating B.C. inflator hose by Craig Radelman in the Driftwood column of your May, 1975

*(Continued on Page 12)*



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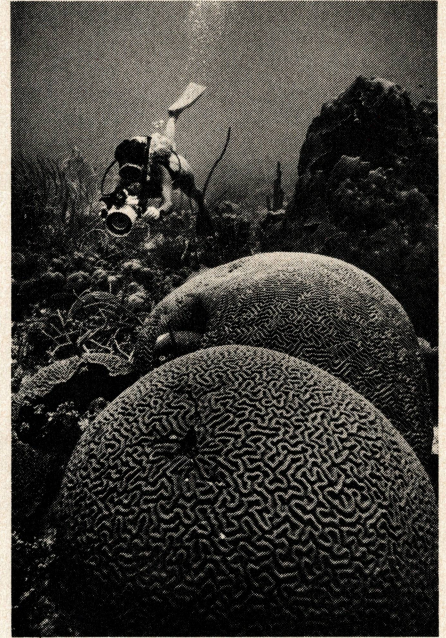
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## SEAMARK '75

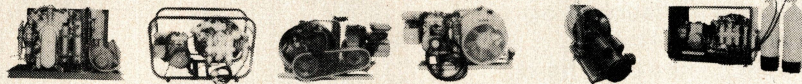
The Coting School for Handicapped Children, located in Boston, Massachusetts, is a private, but free, institution devoted to the education and training of the physically handicapped child. The school's objective has been, since 1893, to provide for the necessary educational, vocational and medical training programs for any child who cannot attend a regular school because of his or her handicap, and to lead them to a self-sufficient adulthood. The school is supported solely by legacies, bequests and gifts with no government funding.



Seamark '75, a program initiated and run by northeast area divers, established a fund-raising goal of \$10,000 to aid the school in building a Vision Clinic for the diagnosis and treatment of vision problems. There are no administrative expenses, and all proceeds from Seamark '75 will go directly to the Cotting School. The Seamark '75 Committee consists of more than 40 volunteer workers representing all facets of the diving community: PADI, YMCA, NAUI, NASDS, professional dive retailers and clubs, equipment manufacturers and divers.

Seamark '75 will be held at the New England Aquarium, Boston, Mass., on October 11, 1975, at 8:00 p.m. There's plenty of convenient parking nearby, and the Aquarium can easily be reached by public transportation. The Aquarium boasts facilities unmatched in the area for this diver-oriented fund raising event: the 1,000 person capacity show-tank Pavillion where an amazing performance of trained dolphins is scheduled for 9:00 p.m.; a dance floor and band for dancers; an auditorium where slides, films and talks will be held throughout the evening; the main building with four levels of displays of hundreds of marine species, where a long social evening will be held for divers and guests to meet and talk to famous diving and political per-

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sonalities; and many other attractions including six strategically located bars so that no one need remain "dry."

Scheduled guests are Massachusetts' Lt. Governor Tom O'Neil, the Governor's Chief Secretary Dave Liederman, SKIN DIVER Publisher Paul Tzimoulis, shark lady Eugenie Clark, Stan Waterman, Joe MacInnis, Al Giddings, Dave Doubilet, Bill McDonald, Jim Cahill, Frank Sanger, Frank Scalli and many others.

Funds are being raised in three ways: by contribution, direct sale of attendance tickets and by raffling scuba equipment. Contributions of \$1000 each have already been received from the Boston Sea Rovers from its Richard W. Irvine Grant Fund and from the Massachusetts Elks.

Attendance tickets, which are available for a \$10 tax-deductible donation, are good for all events except the raffle and include one complimentary cocktail. Attendance and raffle tickets may be purchased at any professional dive retail stores, or by writing to: Phil Holt, Seamark '75, P.O. Box 216, Gloucester, Mass. 01930. Information can also be obtained by calling (617) 283-4103.

### FRONTIERS IN DIVING

Innerspace Odyssey — Frontiers in Diving is the title of a symposium to be held in Gainesville, Florida, on January 24-25, 1976. Sponsored by the Barnacle Busters Divers, the event will cover the latest research and current developments in the sport. Topics range from diving legislation, liquid breathing, bone necrosis and stress psychology to the latest findings on drowning and decompression. The distinguished panel of experts include, among others, Dr. Johannes Kylstra, Paul Tzimoulis, Dr. Bill Hutchison and Dr. George Bond.

Proceeds from the Symposium are earmarked for a new recompression facility in Gainesville.

For further information write to: Innerspace, Barnacle Busters Divers, P.O. Box 12823, University Station, Gainesville, FL 32604.

### QUEBEC INSTRUCTORS

A provisional committee composed of instructors from ACU, NAUI, PADI, has been created. Its objective is to prepare the foundation for a professional association which will regroup all the diving teachers of Quebec.

The aim of this association is not to overrule the association to which you are already affiliated, but instead its objectives will be to regroup all the diving teachers of Quebec, regardless of affiliation, on an equal basis, to facilitate exchanges and eventually write down a diving law for the Province.

The provisional address of this committee is: Quebec Association of Diving Instructors, c/o Federation des Clubs de Plongee du Quebec, 1415 Jarry St. East, Montreal, H2E 2Z7, Quebec.

## If the suit's wrong, you won't look right.

Have you noticed how many guys in wet suits look like store window mannequins? Like wind-up divers. It's not the guy, it's more likely the suit. Probably a suit with a few things wrong. □ As a contrast, next time you see someone wearing a Sea Suit, notice how great he looks! □ We've been making wet suits for over 24 years, and at this point we can't help but make a suit look right. They fit well, they're constructed to the highest standards, they're used by professionals everywhere. □ Next time, ask for Sea Suits. They fit where it counts... When you're right, you're right.

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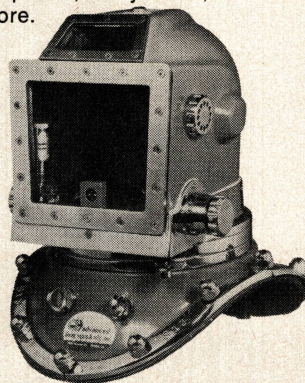
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J. Shimberg, R. Ritter, R. Holdsworth and many more.

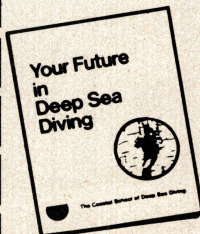
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SD-105



(Continued from Page 8)

issue. As an instructor, I would rate this practice under the heading of "dangerous practices" from the realization of the possible confusion which could easily arise when another passing diver's arm, fin, gauge, octopus rig, or even a piece of kelp finds its way between that string and the diver's vest. A breakaway attachment might be feasible to solve this problem.

Too many oddities happen underwater and one should use foresight and be safety conscious before attaching anything permanent to the diver's body.

HANK KETELS NAUI #1092  
FOOTHILL COLLEGE LOS ALTOS, CA.

... When I recently received a new diving catalogue from a national distributor I noticed while reading through the description of Farallon's lighted instrument panel that all Farallon gauges can be special ordered in the metric system. I then remembered an article in SKIN DIVER which talked about the use of the metric system in diving, specifically dwelling on the ease of computations for remaining air at depth, etc. However, the usefulness of the metric system is limited for me at least since I have never seen any version of the Navy decompression tables in metric form ...

Is there any version of the Navy decompression tables in the metric system ... I would greatly appreciate any leads or direct information that you or any readers might be able to shed on this problem.

RICHARD B. GREER HOLIDAY, FLA.  
*The current U.S. Navy Diving Manual does not list the tables in metric, but does discuss conversion of feet to meters in the manual's text. We asked NAUI if they had seen the tables in metric and they reported that the only decompression tables they'd seen in metric were those from England. As the conversion from feet to meters will not figure to even meters, NAUI suggested that perhaps the Navy would recompute the current decompression tables.*

... A group, IMA 6, is beginning a project dealing in saturation techniques. The group is fairly new and lacks the knowledge in this field to continue their research effectively. We would like to deal with any person, professional or amateur, having knowledge of saturation techniques and systems. Our time is limited so responses are needed immediately. If you want help, please write.  
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### SDM Instruction

October 3-5, 10-12, 17-19

YMCA Scuba Instructors Institute, Newport News, Va. (Contact: Charles Dubay, 105 Allyson Dr., Williamsburg, Va. 23185)

October 4-5, 11-12, 18-19, 25-26

PADI Instructor Training Course, Fayetteville, N.C. (Contact: John Valdes, 1906 Wayne Lane, Fayetteville, N.C. 28304)

October 11-12; 25-26; November 8-9

YMCA Scuba Instructor Institute, Maine. (Contact: Joe Gallant, 41 Belmont St., Portland, Maine 04104)

October 11-17

YMCA Scuba Institute, Key West, Fla. (Contact: Lynne Hardin Sweeney, Key West Scuba Center, P.O. Box 331, Key West, Fla. 33040)

October 11-18

YMCA Scuba Instructors Institute, Mexico City. (Contact: Enrique Rodriguez, C Carbonera 129, Mexico DF 21, Mexico)

October 13-December 19

PADI Instructor Training Course, 10 week resident, Jacksonville, Fla. (Contact: PADI College, 4593 St. Johns Ave., Jacksonville, Fla. 32210)

October 24-26, November 21-23, December 5-7

YMCA Scuba Instructors Institute, Orlando, Fla. (Contact: David Dunsforth, 433 N. Mills Ave., Orlando, Fla.)

December 13-December 20

PADI Instructor Training Course, Southwest Texas State University. (Contact: Donald Dibble, 1426 Ranch Rd. #12, San Marcos, Texas 78666)

December 27-January 3

PADI Instructor Training Course, Jacksonville, Fla. (Contact: PADI College, 4593 St. Johns Ave., Jacksonville, Fla.)

January 5-March 12

PADI Instructor Training Course, Jacksonville, Fla. (Contact: PADI College, 4593 St. Johns Ave., Jacksonville, Fla.)

March 15-March 21

PADI Instructor Training Course, Jacksonville, Fla. (Contact: PADI College, 4593 St. Johns Ave., Jacksonville, Fla.)

March 22-28

PADI Instructor Training Course, Jacksonville, Fla. (Contact: PADI College, 4593 St. Johns Ave., Jacksonville, Fla.)

April 5-June 11

PADI Instructor Training Course, Jacksonville, Fla. (Contact: PADI College, 4593 St. Johns Ave., Jacksonville, Fla.)



June 14-June 20

PADI Instructor Training Course, Jacksonville, Fla. (Contact: PADI College, 4593 St. Johns Ave., Jacksonville, Fla.)

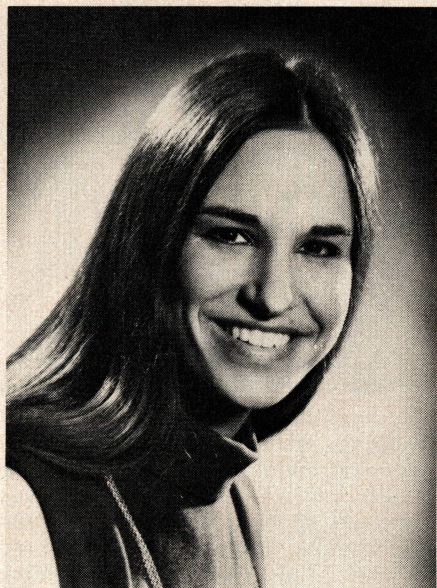
June 21-27

PADI Instructor Training Course, Jacksonville, Fla. (Contact: PADI College, 4593 St. Johns Ave., Jacksonville, Fla.)

July 12-September 17

PADI Instructor Training Course, Jacksonville, Fla. (Contact: PADI College, 4593 St. Johns Ave., Jacksonville, Fla.)

## LYNN EBRO JOINS SEA SUITS



Sea Suits is pleased to announce the appointment of Lynn Ebro to their staff of fine representatives. She will be presenting their diving, water skiing and surfing lines in the states of North Carolina, South Carolina, Tennessee, Kentucky, Mississippi, Georgia, Florida, Alabama and Louisiana.

Lynn has been well known in the diving industry for many years, having been associated with SKIN DIVER and a representative for other companies. She is now located in Miami, Florida. >#

## MILITARY DIVERS

The European Divers Association was originally established to provide goods and services to the U.S. military diver in Europe. However, they are expanding their service to include military divers anywhere in the world. To military addresses they can send equipment at rock bottom prices, often direct from the factory in Europe. Their monthly newsletter is interesting and informative. In fact, anyone planning to come to Europe for some diving would do well to contact them. Membership in the association is \$5.00 per quarter. Contact Curt Halter, European Divers Assoc., P.O. Box 2812, APO New York 09057. >#

# FROM NOW ON IT'S...



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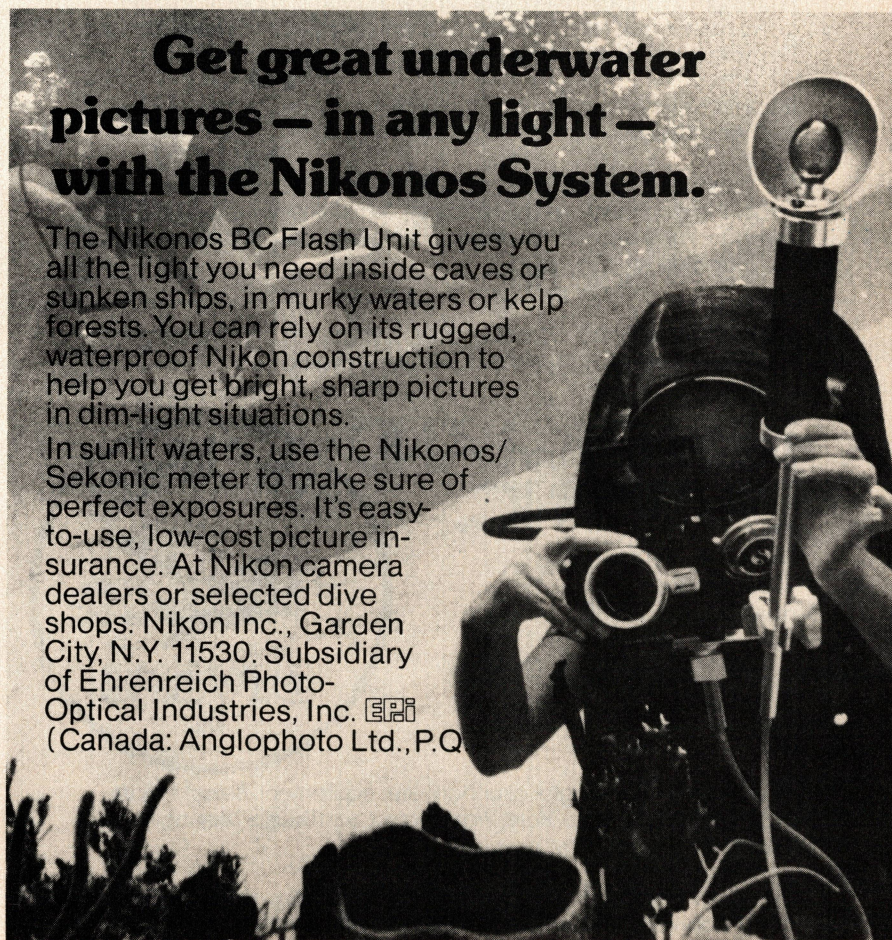
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In sunlit waters, use the Nikonos/Sekonic meter to make sure of perfect exposures. It's easy-to-use, low-cost picture insurance. At Nikon camera dealers or selected dive shops. Nikon Inc., Garden City, N.Y. 11530. Subsidiary of Ehrenreich Photo-Optical Industries, Inc. EPI  
(Canada: Anglophoto Ltd., P.Q.)





# OCTOBERFEST.

A festival of special packages at New England Divers  
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Steel 71.2 galvanized tank with J valve, Super Stag (non cam) back pack, tank boot and Aquarius Regulator. Free air for life. Life time guarantee on tank and regulator.

**\$168.00**

Aluminum 71.2 tank in yellow or gray with J valve, Super Stag (non cam) back pack, tank boot and Aquarius Regulator. Free air for life. Life time guarantee on tank and regulator.

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Rocket fins, Healthway scubamaster black neoprene mask w/purge and Aqua flex snorkel with old style mouthpiece.

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1/4 " Wet Suit. Textured Standard with rib cage pants, nylon lined, gussets under the arms and crotch, offers freedom of movement. All seams are glued and stitched for added strength. Sizes S, M, L, XL Men S, M, L Women

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## NEW ENGLAND DIVERS INC.

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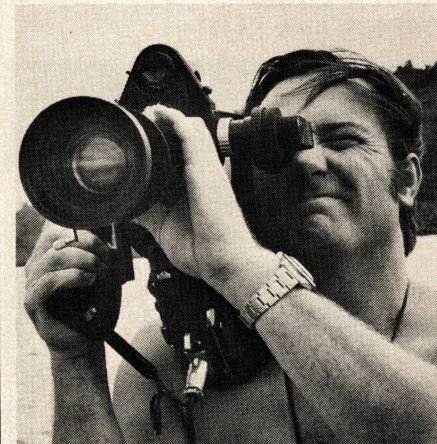
World's largest distributor of underwater equipment. Beverly, Mass. Miami, Florida; Seattle, Kent, Washington; San Diego, Los Angeles, California. Open 7 days a week.

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## INNERSPACE PACIFICA '75

November 6 and 7 mark the dates for Innerspace Pacifica '75, Hawaii's annual Film Festival and International Photo Contest sponsored by the Hawaii Council of Diving Clubs, the University and State of Hawaii, and the newly formed South Pacific Chapter of NAUI Instructors. Again this year a cast of the world's most outstanding underwater photographers will present their new achievements in cinematography.

Scheduled to set the pace of the evening's saturation experience is Al



Giddings' new movie, *The Sea of Eden*. Giddings, when not traveling around the world on motion picture assignments has assembled an epic featuring caves, drop-offs, sharks and exciting adventure in the exotic islands of Palau. Jack McKenney, Editor of SKIN DIVER, is sending his widely acclaimed new movie, *Fish Antics*. Angelfish, batfish, jacks, sharks, rays and flounders are some of the beautiful and interesting subjects highlighted from Australia and the Caribbean. These are only a sample of what's in store as both evenings promise to intoxicate the viewers with entertainment.

Other highlights of both performances will be slide presentations of the winners from the International Photo Competition. As in previous years, this prestigious collection promises to be the world's best. If this isn't enough, the doors will open early both evenings for strolling through the exhibit hall where local aquatic-related businesses and factory representatives will be presenting the latest in diving equipment and marine technology. Bursts of color will catch your eye during this easy social period with the display of prints from the photo competition beginning experience in photography at its best.

Tickets are only \$3.50 for each performance and are available at dive shops, through dive clubs, or at the door for \$3.75 — so buy early.

Photo contest rules and entry forms may be obtained by contacting Bill Reed, 98-1465 Kaonohi St., Aiea, Hawaii 96701. Come to Innerspace Pacifica '75 — it may take weeks to decompress.



# ABOVE AND BEYOND

SCUBAPRO goes above and beyond manufacturing diving equipment. We conceive, design and develop original products that contribute to your diving safety and enjoyment. SCUBAPRO has produced more patented products and introduced more original concepts than any other diving manufacturer. Imagination in diving is SCUBAPRO.

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# Safety Signal...

Farallon's Multi-Tissue Decomputer® is a tiny analog computer that automatically integrates and stores time and depth on single and repetitive dives, and displays your resulting decompression status with the ease of a traffic light. Designed to approximate the U.S. Navy tables for "No Decompression" dives, the Decomputer eliminates your decompression by indicating you should surface before it is required.

When the black sensor indicators are in the green, you're safe. If either indicator moves into the yellow, you are approaching your "No Decompression" limits, and should surface before it reaches the red. If you accidentally hit the red, simply ascend to ten feet, wait five minutes, and you can safely surface.

Calibration free and undamaged by high altitude flights, the Farallon Decomputer® lets you dive like you drive, with safety signal simplicity.



Farallon Industries, Belmont, Calif.



# SDM'S National Scuba Exam

## What's your Cave Diving Safety I.Q.?

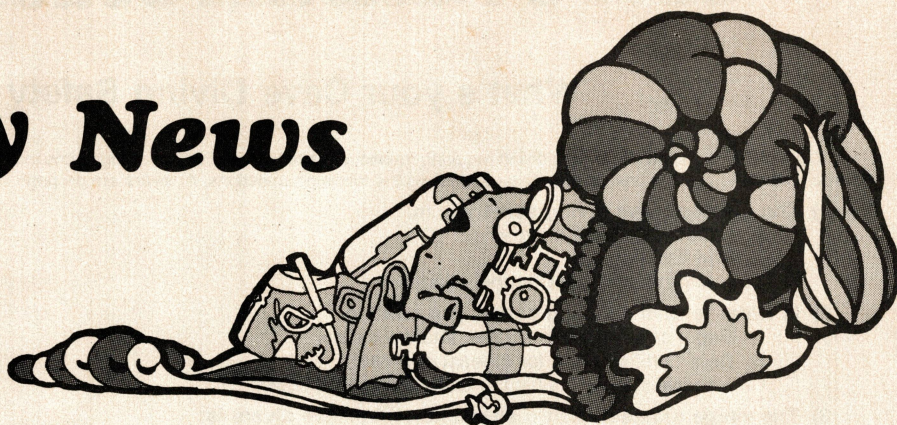
Cave diving is a specialty area of diving requiring trained, experienced and skilled diving teams to exercise a high degree of self-discipline. Test your knowledge of this unique activity by answering the following questions. Answers are on page 25.

- 1) **The greatest cave diving activity is in:**
  - ☐ A. Florida and the Bahamas.
  - ☐ B. The Eastern U.S.
  - ☐ C. California and the Channel Islands.
- 2) **In order to dive safely in caves, you need to:**
  - ☐ A. Begin cave diving in simple, shallow caves.
  - ☐ B. Be a certified diver for at least one year.
  - ☐ C. Receive special training in cave diving techniques.
- 3) **The single greatest hazard encountered by cave divers is:**
  - ☐ A. Becoming lost.
  - ☐ B. Silt.
  - ☐ C. Running out of air.
- 4) **A safety line must be used in cave diving:**
  - ☐ A. In every instance.
  - ☐ B. When the entrance cannot be seen from inside the cave.
  - ☐ C. When the diver is not totally familiar with the passages.
- 5) **The safety line is used to:**
  - ☐ A. Show direction only.
  - ☐ B. Measure the penetration into the cave.
  - ☐ C. Signal other divers who hold onto the line.
- 6) **The preferred air supply for cave diving is:**
  - ☐ A. Double tanks with a J-valve.
  - ☐ B. Double tanks with two regulators.
  - ☐ C. Two separate tanks, regulators and octopuses.
- 7) **The center of buoyancy for a cave diver should be:**
  - ☐ A. Near the shoulders.
  - ☐ B. Near the stomach.
  - ☐ C. Near the hips.
- 8) **During the exploration of a cave, a diver's feet should be:**
  - ☐ A. Below the diver's head.
  - ☐ B. Above the diver's head.
  - ☐ C. Level with the diver's head.
- 9) **The air reserve at the furthest point of penetration should be:**
  - ☐ A. 66% of the total supply.
  - ☐ B. 50% of the total supply.
  - ☐ C. 33% of the total supply.
- 10) **Three cave divers should have a total of:**
  - ☐ A. Three lights.
  - ☐ B. Four lights.
  - ☐ C. Six or more lights.
- 11) **Cave diving safety has been promoted primarily by:**
  - ☐ A. The National Association for Cave Diving.
  - ☐ B. The national diver training agencies.
  - ☐ C. Regional certification programs.
- 12) **Decompression time for cave diving should be based upon:**
  - ☐ A. Time at maximum depth.
  - ☐ B. Time on the bottom regardless of depth.
  - ☐ C. Time from leaving the surface until beginning ascent.
- 13) **Double hose regulators should not be used in cave diving because:**
  - ☐ A. The bubbles exhaust behind the diver and cannot be used to determine direction.
  - ☐ B. Double hose regulators usually lack a high pressure port for attaching a submersible pressure gauge.
  - ☐ C. It is difficult to buddy breathe and swim horizontally using a double hose regulator.
- 14) **During a silt out, a diver unable to find the safety line should:**
  - ☐ A. Remain perfectly still.
  - ☐ B. Proceed by feel until clear of the silt.
  - ☐ C. Increase buoyancy and rise slowly to the ceiling.
- 15) **The ideal number of cave divers for a cave dive is:**
  - ☐ A. Two experienced and trained divers.
  - ☐ B. Three experienced and trained divers.
  - ☐ C. Four experienced and trained divers.



# Industry News

## Healthways



By Nancy Ackerman

**H**ealthways has been in existence now for 22 years, and must be considered one of the more prominent names of a basic scuba equipment manufacturer. As a "pioneer in the scuba industry," Healthways began in Los Angeles, California in the early 50's. They began, basically, as a rubber manufacturer, making masks, snorkels, and fins. They proceeded into the production of two-hose regulators, hardware, and even wet submersibles.

While Healthways has certainly gone through changes in their 22 years, scuba gear has remained an important, major part of their business. Having grown up with scuba diving, the company has changed and progressed with the sport.

Their present line includes gauges, scubapaks, tanks and tank boots, masks, fins, snorkels, buoyancy compensators, knives, spearguns, weights and weight belts. They are extremely proud of their quality control and safety standards.

Though they emphasize their improvements in technical design and quality, they readily admit that "without the people" they couldn't maintain their "prominent position in the professional diving industry."

At the top of the ladder is general manager and vice president of Healthways, Bob Gray. Gray's background was originally in electronics and, five years ago, was introduced to the diving industry. He began working at Healthways two

years ago, during a period of great change for the company. The SKIN DIVER interview was held with Bob Gray, and it was at that time that he verbally acquainted us with the backbone of the organization:

Bill Martin is in charge of production and has been with Healthways for 13 years. Rick Smith is the manager of quality control and warranty service. Dan Merrifield has been diving and involved with the diving industry since its earliest

photograph by Jack McKenney



*Bob Gray, vice president and general manager of Healthways.*

years; he is now Healthways engineering manager. Bruce Anderson, both a NAUI and PADI instructor, is their factory sales engineer. John Elmgren is the customer service coordinator; his brother, Mark Elmgren, is the production control supervisor. Roy Romano is the national sales manager, and has 14 sales groups representing Healthways in the United States as well as an international sales organization. Betty Magruder is the indispensable secretary to Roy Romano. Aileen McGlasson, who has been with Healthways for 12 years, is the head of personnel and customer service, and is Bob Gray's administrative assistant.

This group of people exemplify the well-rounded, talented, dedicated individuals who make up the successful Healthways organization. Their average production employee has been with the company for five years.

Their ambition and pride will make Healthways remain a significant factor in the diving industry. Their direction and emphasis will continue to allow better and safer equipment to be available to today and tomorrow's divers. Items such as their new stainless steel high pressure hose will continue to be developed and researched, and keep Healthways progressing with their industry. Companies like Healthways will help keep the sport of scuba diving a safe and reasonable pastime with the latest in technological advances in equipment. >#



# skin diver

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An interview with:

# Burton McNeely

Underwater photojournalist and photoillustrator.

**Parkway:** How do photojournalism and photoillustration differ?

**McNeely:** When I cover an underwater event that I can't control, I consider it photojournalism. Like when I shot the Aluminaut Submersible, deep in the gulfstream, for Reynolds. Or the underwater action of Chrysler's outboards.

**Parkway:** Can you ever control your subjects underwater?

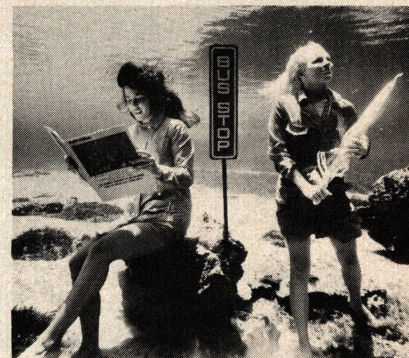
**McNeely:** Oh yes. By rehearsing scenes topside so that the models know what to do when we move underwater I have achieved excellent control.

**Parkway:** Do you have difficulty finding underwater models?

**McNeely:** Not at all. There are many models who dive. They must be expert divers, however, because sometimes we spend hours underwater and I may be the only one wearing scuba.

**Parkway:** Then how do your models breathe underwater?

**McNeely:** By various methods. For example, when I set up a bus stop scene for a raincoat fashion spread, the models held small air tanks in their hands. On my signal they were hidden behind a rock. After posing for thirty seconds the models recovered the tanks and resumed breathing. This procedure was repeated until I had the right photo. Other times models free-dive into position or use hookah stationed just outside the picture.



**Parkway:** What equipment do you use?

**McNeely:** My camera is a motor driven Hasselblad with a 50mm wide-angle lens. It's in a special housing I designed and built. I've also built a unique split lens which shoots over-and-underwater simultaneously, without distortion. For personal comfort I wear a shark-skin two suit.

**Parkway:** Why shark-skin two?

**McNeely:** My work depends on my ability to concentrate. I can't be thinking about anything but getting the picture. Shark-skin two helps by keeping me warm and comfortable and letting me move with complete freedom. I've tried many suits over the past twenty years but I've never found one that outperformed shark-skin two.

His choice is  
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**Parkway  
Fabricators**

291 New Brunswick Ave.,  
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# AMF SWIMASTER 3SL20 U/W STROBE

An Exclusive SDM Product Report

By Jack McKenney

**P**robably most of the top underwater lensmen in this country shoot 75 percent of their underwater pictures with artificial light. Generally close-ups, and especially macro photos, are totally lit with artificial light and most wide angle shots are made with fill-in flash. This eliminates dark shadows in masks and highlights colors and skin tones.

During the last few years, thanks to space age and electronic technology, strobes have been designed into packages measuring just a few inches in size and weighing ounces instead of pounds. This trend toward compactness has greatly eased the burden of the traveling underwater photographer.

One of the latest additions to the underwater strobe market recently introduced by AMF Swimaster, is a compact 18 watt-second strobe with a flash guide number of 40 when using ASA 25 film and rated in air. The ASA 64 guide number is 64, and 100 for ASA 160 film. The 3SL20 measures just six inches long by three and one-quarter inches in diameter, stands 10 1/4" high and weighs only 27 ounces out of the water. It is powered by two "C" size alkaline batteries and will provide between 300 and 400 flashes before a new set of batteries are required.

The electronics are encased in a rugged ocean blue ABS plastic housing. ABS is impervious to natural forces and will resist the effects of most industrial chemicals, too. A single control on top of the 3SL20 turns the strobe on and off and a light on the side indicates when the unit is ready to fire — about every six seconds, depending on battery charge level.

When shooting extensively, it's best to alternate batteries every other day. On a trip to the Cayman Islands a few months ago, I took this new strobe along with me and used it almost daily over a two week period. And two sets of batteries which cost me a total of \$2.60 kept the unit firing during the entire trip. When recycle time approaches 30 seconds, it is time

to put in a fresh set of batteries and throw the old set away.

The 3SL20 is equipped with a four foot three inch long Electro Oceanics (EO) connector — the popular universal electrical connector that is utilized on most underwater camera systems. When used in conjunction with a Nikonos camera, the strobe can be quickly removed from the camera base plate that comes with the strobe and held out to the side or overhead at full arm's length for different lighting effects. The quick disconnect button on the handle is operated with just a squeeze of the index finger and then reconnected by clicking it back down over the base plate post.

If used with a Nikonos camera, a female EO connector will have to be obtained either from Oceanic Products in San Leandro or Sub Sea Products in San Diego. Many dive stores carry these connectors which retail for around \$65.

Although the light output is only 1000 BCPS (beam candle power seconds), light intensity falling on the subject approaches that of some of the more powerful, wider angle strobes because the 60° angle coverage of the 3SL20 is more concentrated. I measured light output of the 3SL20 topside with a Wein flash meter set at 64 ASA and came up with the following aperture settings: Distance — 3 feet, f stop — f16-22; distance — 5 feet, f stop — f8-11; distance — 7 feet, f stop — f5.6-8.

Although the 3SL20 will not cover the subject area of a corrected 21mm or 15mm lens, it will cover anything up to a 28mm uncorrected lens. I like to use it primarily for close-ups because of its small size and weight. Although the manufacturer states that it weighs five ounces in the water, when detached from the base plate it will float in sea water. It really is a featherweight and is easy to manipulate while diving.

The 3SL20 breaks down into two sections by unscrewing the retainer bolt on the rear of the housing. It's important to keep the main body O ring and the outer retainer bolt O ring clean and free of foreign matter and lightly lubricated with silicone grease to assure a watertight seal. There is also an O ring on the inside of the housing around the retaining bolt to prevent the bolt from falling out and getting lost when the housing is apart, but this O ring isn't required for watertight integrity. The manufacturers suggest that the retaining screw be tightened firmly with a screwdriver before entering the water.

Before heading out on an extended dive trip, it would be wise to obtain the following spare parts: housing retaining bolt, silicone grease, spare batteries, and three O rings — a Parker 2-150, Parker 2-110, and a Parker 2-007.

When used for lighting close-ups, the 3SL20 will perform as well as any large strobe, and if you want a subtle artificial light fill in, it will work well for that, too, in clear water up to five feet away. But even in water like Southern California's, where visibility is perhaps only 30 feet most of the time, using high speed Ektachrome in conjunction with this fine little strobe should greatly improve your photographs by shedding a little light on your underwater subjects.

The 3SL20, retailing for \$235, is available from many pro dive stores, or you can write to AMF Swimaster, 3801 South Harbor Blvd., Santa Ana, Ca. 92704. Canadians may write to 135 Oxford Street, Guelph, Ontario, Canada N1H6N8.

photography by Author





# SUPERSUIT

PATENT NO. 3,731,319

photograph Emerson Mulford

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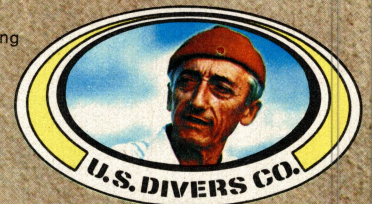
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# SDM'S National Scuba Exam

## What's your Cave Diving Safety I.Q.?

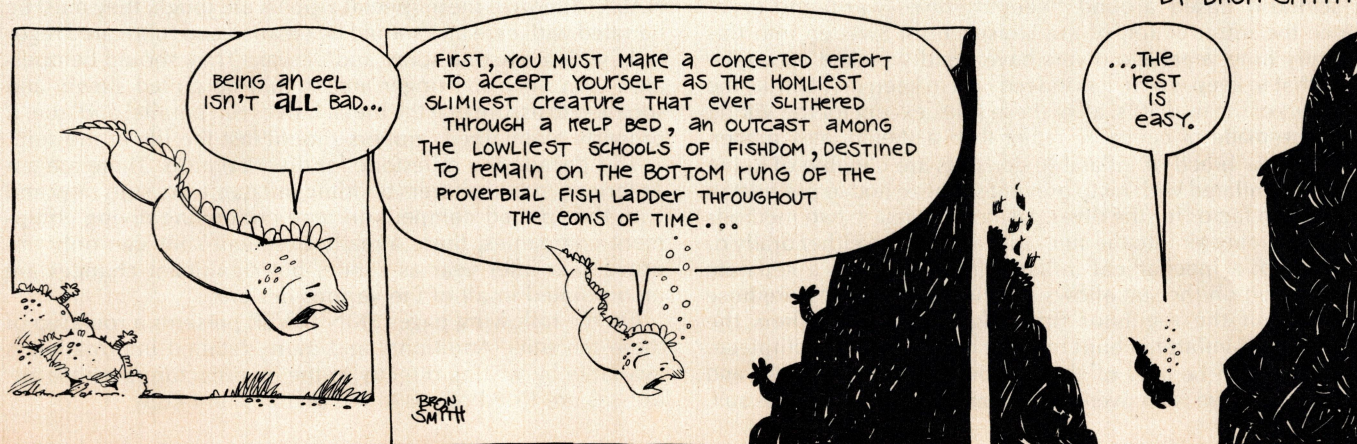
Answers from questions on page 19.

- 1) A. Florida and the Bahamas. While caves do exist in many regions, the greatest activity by far is in Florida and the Bahamas. The popularity of Florida caves coupled with untrained cave divers poses serious problems for the area. Get training before diving in caves — Florida, the Bahamas or anywhere else . . . .
- 2) C. Receive special training in cave diving techniques. Equipment, diving experience and an "easy" cave will not assure safety in cave diving, but training provided by a qualified cave diving instructor will make your cave diving experiences safe and enjoyable.
- 3) B. Silt. Becoming lost and running out of air are serious potential problems for cave divers, but silt can reduce visibility to zero, cause delays in exiting and separate divers from each other and the safety line.
- 4) A. In every instance. No matter how shallow the penetration, a safety line should be used. Silt or an unnoticed turn in a passageway can cause disorientation and confusion.
- 5) A. Show direction only. The line is never to be pulled on by divers. Divers should remain within an arm's length of the line and form an "O" around the line with thumb and forefinger if the line cannot be seen.
- 6) B. Double tanks with two regulators. J-Valves can be bumped and the air supply exhausted without realization. The preferred tank configuration is two tanks joined by a special manifold. Two regulators (one serves as an octopus) are placed on the manifold and have access to all air in both tanks.
- 7) B. Near the stomach. By keeping your center of gravity near your center of gravity, you are able to pivot in any direction easily.
- 8) B. Above the diver's head. In this position, divers can use the fins without creating the downward turbulence that causes silt to rise. The proper angle can only be learned from an experienced instructor, for too high an angle will restrict forward progress.
- 9) A. 66% of the total supply. Thirty-three percent of the supply will be needed to return to the cave entrance and the remaining one third is to be retained for emergencies.
- 10) C. Six or more lights. Each diver should have at least two lights. Many experienced cave divers carry two back up lights and a primary light for safety. The primary light should have a power rating of at least 30 watts.
- 11) A. The National Association For Cave Diving (NACD). NASDS, NAUI, PADI and the YMCA all offer cave diving certification programs, but the NACD was the first to promote cave diving safety and education. The NACD conducts an excellent national seminar annually and distributes texts and information on cave diving to educate and to increase the safety of cave diving.
- 12) C. Time from leaving the surface until beginning ascent. Compute the time from the moment of descent and use the maximum depth of the dive. If the depth is between the stated depths of the U.S. Navy dive tables, the greatest depth should be used.
- 13) C. It is difficult to buddy breathe and swim horizontally using a double hose regulator. The mouthpiece of a double hose regulator can only be passed between divers remaining within a few inches of each other. A properly equipped cave diver uses an octopus regulator with a long hose to eliminate this problem in buddy breathing.
- 14) C. Increase buoyancy and rise slowly to the ceiling. Often a silt out only occurs near the floor of a cave and by gently rising toward the ceiling, you may pass out of the silt. If the silt fills the passage, the first area to clear will be the ceiling. This procedure should only be used if the safety line cannot be located.
- 15) B. Three experienced and trained divers. Four or more divers in a cave cannot be coordinated. A two man team does not have sufficient air reserves to assist a team member in trouble. The three man team provides a better air reserve, more assistance to a diver in trouble and with training can be as easily coordinated as the usual two man open water diving team.

*Regardless of your score, if you have not been trained for cave diving, don't attempt or reattempt this highly specialized aspect of diving until you have been thoroughly trained by a qualified and experienced cave diving instructor. Knowledge is only useful when applied correctly and the application of cave diving knowledge must be done under the supervision of an expert. If you are an experienced cave diver and missed two or more questions, you should seek additional training prior to any further penetrations. Enjoy the beauty and adventure of cave diving — after proper training. Next month's exam will be on Diving Skills.*

## FISHTALES

BY BRON SMITH





# Inflatable Dry Suits

present  
**'A New Era in Diving Comfort'**  
 starring



**BAYLEY SUIT INC. / HARVEY'S / IMPERIAL MFG. CO. / O'NEILL INC. / POSEIDON SYSTEMS U.S.A. / SEA SUITS / SEATEC / SUB-AQUATIC SYSTEMS / U.S. DIVERS CO. / WHITE STAG WATER SPORTS**

**By Jack McKenney**

This role of leading characters in the diver/garment underwater world might well be considered the perfect typecasting for a scenario based around "keeping-diver-warm-and-dry." Since the introduction of the Unisuit from Sweden into this country nine years ago divers have rapidly picked up on the idea that to keep warm, it is indeed best to keep dry. Unlike the dry suits of the mid 50's, all of these suits, except for the Viking Suit, are made of neoprene rather than a stretch latex rubber.

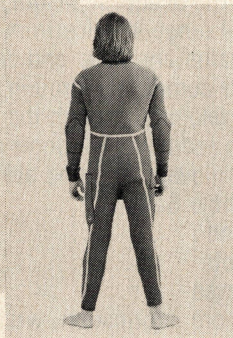
This new breed of inflatable dry suits are capable of being partially inflated with air to prevent squeeze and to provide an insulation factor for the diver. Usually there are two methods of introducing air into the suit — it can be done either orally or by way of a mechanical inflator. In some cases a separate connection on the suit allows inflation via low pressure hose coming off the regulator first stage, and with others the mechanical inflator is built into the oral inflator mouthpiece. Excess air can be bled off through the oral inflation hose, and sometimes there is an over-pressurization valve built in the suit.

Eight out of the ten suits use a gas, water and pressure proof zipper (either Dynat or Talon) that was originally designed for NASA. Although these special zippers are tough, they must be handled with care and should be cleaned and lubricated regularly with a silicone spray and/or wax. They should be operated with only one finger and should be pulled slowly and squarely to assure that the metal halves run parallel and true. If properly maintained, zippers should last the life of the suit.

This decade is a milestone for diver comfort. There are ten American manufacturers building inflatable dry suits now and with the spirited competition inherent among diving equipment companies, these already excellent suits can only improve year after year as subtle, but significant changes are incorporated in all of the various designs.

On the following pages SKIN DIVER presents a roundup of these ten suits. Additional and more detailed information is available by writing directly to the manufacturers whose addresses are listed opposite the pictures and copy.





## BAYLEY SUIT INC. — AQUASTATIC

The Aquastatic is available in two basic styles with a variety of designs ranging in cost from just below \$270 to over \$600. The suit pictured at left is the low price model, but with the addition of knee pads, knife pocket, accessory pocket and convenience zipper, the price goes up. There is the choice of a one or two piece suit, hood attached or separate, any number of pockets, convenience zipper, spinal pad, etc.

A Talon zipper on the model pictured runs across the front of the chest and down each arm. The suit is also available with the zipper across the back of the shoulders. The "Complete Aquastatic" is a two piece suit featuring farmer john pants and a jacket, with a 1/8 inch attached pullover seal on the inside which folds up around the waist to make an airtight and waterproof seal. A Talon zips up the front, and a fold down neck seal and fold in wrist seals, complete the upper suit sealing capabilities.

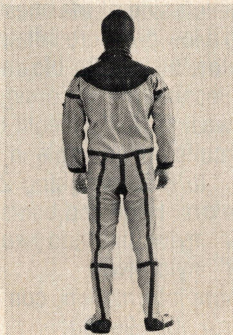
Bayley's AC Buccaneer boots with skin on the outside of the boots, are worn underneath the pants. The skin on the inside of the pant leg seals against the boot effecting a waterproof seal, but eliminates the possibility of the legs ballooning when in the inverted position.

The seams are glued, stitched and covered with a knit finish. All suits have a mechanical inflator which works off the regulator first stage.

Stock sizes running from X small to XX large with short and tall in each size range are carried in the Aquastatic model, but the Complete Aquastatic is available only as a custom made suit. If the standard Aquastatic can't be fitted off the shelf, it too can be custom made. Prices are as follows:

|                           |          |
|---------------------------|----------|
| Aquastatic .....          | \$266.50 |
| Complete Aquastatic ..... | \$637.20 |

For more information, contact Bayley Suit Inc., 900 South Fortuna Blvd., Fortuna, California 95540.



## HARVEY'S — VIKING VARIABLE VOLUME SUIT

This suit is an import from Norway and is the only one in this series that is not fabricated of neoprene. It is made of an orange-colored rubber tricot. The neck seal and cuffs are latex. The boots are attached and entry is made through the neck.

The main purpose of this suit is to keep the diver dry. Warmth comes from the clothing worn underneath and the air shield introduced into the suit. A nylon fur underwear of 100% polyamide is designed to be worn with the suit.

The Viking has two conveniently located inlet and outlet valves which do not hamper the wearing of a personal flotation device. The inlet valve is placed on the lower left side of the rib cage. A low pressure hose comes off the first stage of the regulator and connects onto the valve with a quick disconnect.

The outlet valve is located on the left sleeve on the upper arm. Air can be eliminated from the suit by pressing the valve button, but the valve can be adjusted so that it opens automatically during ascent. The range varies from one inch water pressure minimum, to ten inches water pressure maximum.

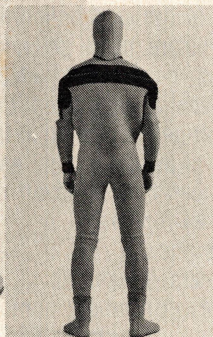
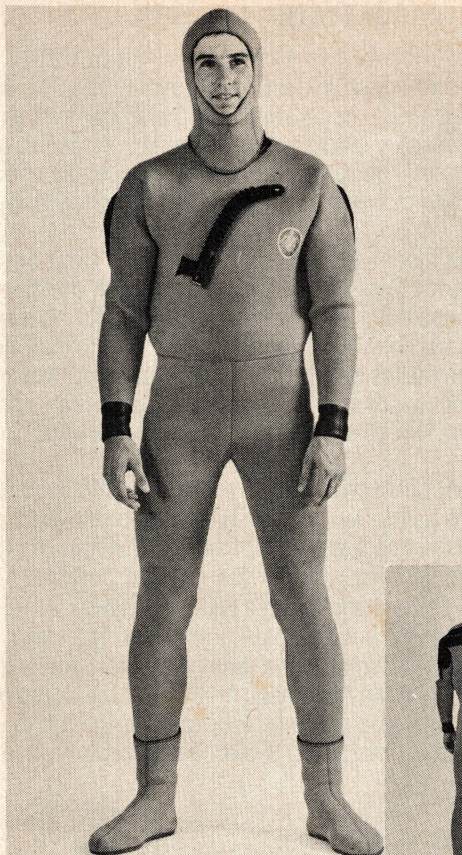
The suit can be donned and doffed by the diver without assistance, but the latex collar is vulnerable to tearing, so care must be taken when dressing. A neck seal only can be used in place of a hood.

Tears can be easily repaired, and all latex parts come as spares. The suit comes with hood, neck rings, regulator, suit hose and repair kit.

|                                   |          |
|-----------------------------------|----------|
| Viking Variable Volume Suit ..... | \$375.00 |
| Nylon Fur Underwear .....         | \$120.00 |

For more information, contact Harvey's, 2505 South 252nd Street, Kent, Washington 98030.





## IMPERIAL MFG. CO. — BUBBLE SUIT

A back entry suit featuring a waterproof Talon zipper, the Bubble Suit by Imperial is available in blue, black, or orange nylon two in 1/8", 3/16", or 1/4" thickness. The Glow-flex and/or King Turtle is a Japanese, closed cell, gas blown neoprene that has proven to be popular with Imperial customers because of its suppleness and flexibility. The neck, wrist, and ankle seals, however, are all made from American made Rubatex — 1/8 inch nylon one side, and skin one side. These seals are made watertight by folding the cuff in after the suit has been put on so the smooth neoprene side is against the diver's skin. When air is introduced into the suit, it forces the suit out, but the folded cuff is forced in, effecting an even better seal. And because the seals are thin neoprene, they are very comfortable.

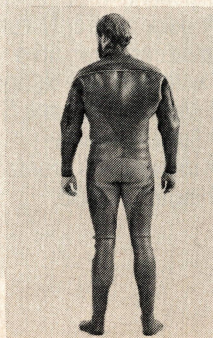
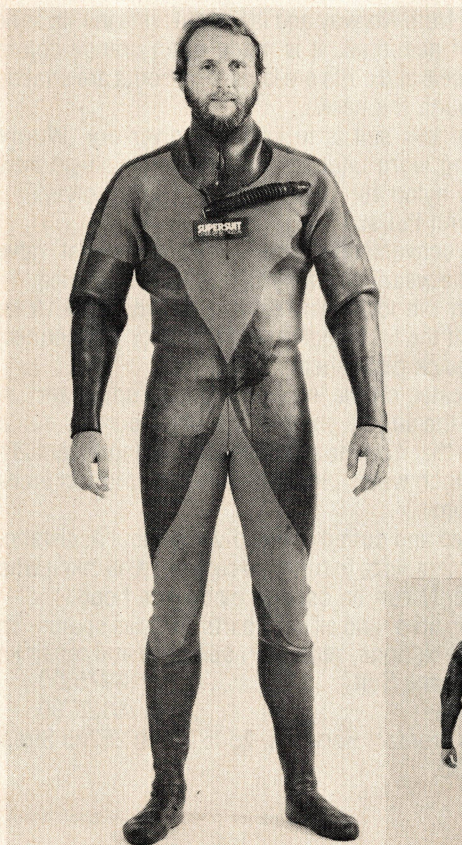
As with any back entry suit, an assistant is required to operate the zipper when a diver is dressing in and out of the suit. Each Imperial Bubble Suit is made on a custom basis and individual measurement forms are available from most dive shops. An oral inflator attached high on the chest allows for air inflation and deflation. And, of course, it's possible to adapt a mechanical inflator such as the Scubapro BC inflator, the Sequest inflator, or a Seatec inflator to the oral inflator. These all range in price from \$28 to \$40.

All seams are glued and sewn, but the outside stitching doesn't penetrate completely through the suit. This eliminates a possible leak from developing through the thread holes.

For an additional \$4, boots can be attached to the suit. Accessories such as gloves and hood are extra.

|                   |                      |
|-------------------|----------------------|
| Bubble Suit ..... | \$259.90             |
| Hood .....        | \$ 16.40             |
| Boots .....       | \$ 22.00             |
| Gloves .....      | \$ 11.30 to \$ 16.50 |

For more information, write directly to Imperial Mfg., Box 4119, Bremerton, Washington 98310.



## O'NEILL INC. — SUPERSUIT

Supersuit is constructed of either all 1/4" nylon two, or with a blend of nylon one and two-sided neoprene. In the latter, the tough nylon two is placed in areas such as the knees and upper inner legs and fanny, where abrasion is usually high. The rest of the suit is made of flexible nylon one, with nylon on the inside for comfortable body movement. All of the seams are glued and then backed with a thick, strong piece of tape. Both the front and back of the suit features a unique, comfortable V design running from the shoulders down to the waist, and then a reverse V spreading down from the waist to around the knees. A Talon zipper runs across the back of the shoulders.

Snug fitting, soft soled "sunsocks" can be attached to the suit to maintain absolute dryness of the legs. A standard pair of boots fit over them providing added warmth and protection for the feet. A special contouring tape folds in around the neck ensuring a watertight seal. With the neck seal folded in, and with air in the suit, air forces the outer section slightly outward — and presses the part that is folded in snugly against the neck, preventing leakage. A separate hood is used.

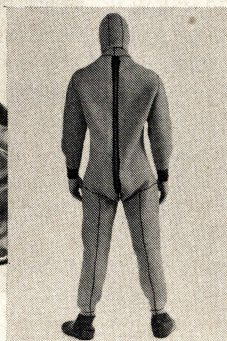
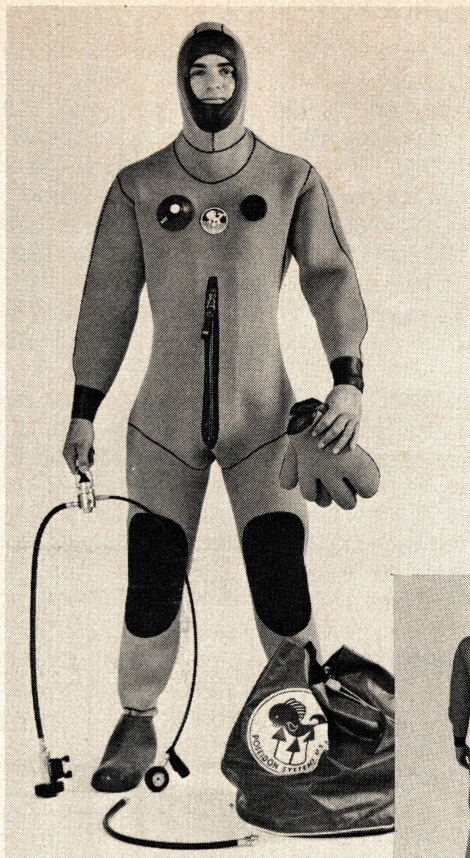
On the left side of the chest of the Supersuit is an oral inflator. By adapting a low pressure inflator hose to the suit from the first stage of a regulator, air can be blown into the suit with a simple press of a button. Because the air coming out of a tank is usually cold, it's a good idea to wear O'Neill's "cold control" undergarment.

Supersuits are available in stock sizes to fit people from 5'2" and 120 lbs., to 6'5" weighing 250 lbs. Custom suits are available for \$20.00 extra. Hood and boots are extra. Attached sunsocks are \$25.

|                              |          |
|------------------------------|----------|
| 1/4" nylon one and two ..... | \$300.00 |
| 1/4" nylon two .....         | \$335.00 |

For more information, contact: O'Neill Inc., 1071 Forty-first Ave., Santa Cruz, Ca. 95060.





## POSEIDON SYSTEMS U.S.A. — UNISUIT

Since the first Unisuit was brought to America by Parkway nine years ago, it has been continually updated and revised. Today there are 30% less seams, all four corner seams were eliminated.

This very well constructed, one-piece suit is made of 1/4 inch G-231 gas-blown Rubatex neoprene with nylon on both sides. It features an attached hood and boots, and a Dynat zipper running from the base of the neck at the back, under the crotch, into the chest area.

A special patented neck seal folds down on the inside of the suit, and prevents water from entering at the neck. A deep pile undergarment is available as an accessory to be worn under the Unisuit.

An air intake push button valve stem is located over the right pectoral muscle and is positioned so the low pressure hose with quick disconnect fitting is directed down under the arm to the first stage of the regulator. On the opposite side of the chest is the purge valve, also operated by pushing a button. This valve features a higher capacity for venting off air than the inlet valve has for injecting air into the suit.

The attached boots on a Unisuit are hot dipped in raw neoprene for three coats, the final coat being a hard gel coat. Neoprene is one of the toughest pliable synthetics available today.

The Unisuit system features its own regulator: the Cyklon 300 features a high pressure port plus three low pressure ports.

Two models of the Unisuit come in three colors and the following items are standard accessories: fin guards, dry mitts, air supply hose, silicone spray, neoprene cement, carrying bag, and grease stick for the zippers. Suits are available in X-small, small, medium, large, X-large and XX-large. For a custom made suit, add \$35.

Blue Unisuit Explorer 1/4" nylon outside,  
skin inside ..... \$375.00  
Orange or black Professional 1/4" nylon two .. \$419.00

For additional information, contact: Poseidon Systems USA, 291 New Brunswick Ave., Perth Amboy, N.J. 08861.



## SEA SUITS — THE INFLATABLE

The most striking difference about Sea Suit's Inflatable is the unique position of the 20 inch long oral inflator hose. It's located at the base of the neck at the back of the suit, and comes over the left shoulder. This is an ideal location for venting the suit from just about any position the diver happens to be in. If a mechanical inflator is adapted to the oral hose, a high neck undergarment should probably be worn under the suit to prevent a blast of cold tank air from hitting the base of the neck when the inflator button is activated.

A fold down neck seal prevents water from washing down over the diver's body should it get in under the hood. The neck seal can be folded down by reaching up from underneath, prior to doing the zipper up. The waterproof Talon zipper is located across the front of the chest and halfway down into each upper arm, so the suit can be put on and taken off without assistance.

Forearms and calf areas of the suit are designed to fit snugly while the rest of the suit fits with a little more freedom — allowing an air cushion for warmth, avoiding air shift into the lower extremities.

The 1/4" or 3/16" Rubatex nylon two suit is available on a custom made basis only, and features sewn and taped seams. A waterproof Talon relief zipper is available as an accessory item. The hood is attached to the suit and knee pads come as standard items. Separate boots and gloves are worn with the Inflatable to create a warm, packaged diver under adverse water conditions.

Inflatable 1/4" model ..... \$325.00  
3/16" model ..... \$325.00  
Relief zipper ..... \$ 25.00

For more information, contact: Sea Suits, 837 W. 18th St., Costa Mesa, Ca. 92627.





## SEATEC — THIRD WORLD SUIT

The TW-100, which is pictured here, features attached hood and hard sole boots. A Dynat zipper runs from the right upper shoulder, back around the neck, and down the front of the suit to the upper left thigh. The zipper is 44 inches long, which allows the suit to open wide for easy donning and doffing. All sewn and glued seams are backed with 3/4 inch stripping on the inside of the suit. Unique features are fold down wrist and ankle seals attached to the inside of the suit. With this design, the ankle seals prevent the legs from getting wet should the attached boots get a hole or tear in them.

Third World Suits also come with an exclusive sealing inner vest attached at the neck which eliminates a fold down neck seal while serving as a vest.

In addition to an oral inflator hose, there is a separate first stage quick disconnect mechanical inflation system, also manufactured by Seatec. In effect, this creates two independent methods of introducing air into the suit — one orally and one mechanically. Seatec has a couple of different types and models of mechanical inflators so you can virtually design your own inflation system into the suit, even stipulating where you want the valves and hose placed.

In addition to the oral inflator/deflator, there is an automatic over pressure relief valve that is designed to eliminate air at 1 1/2 psi over the surrounding water pressure. There is also a manual override dump system built into the valve. Third World Suits are available as a stock or custom suit in Rubatex blue, orange, or black.

TW-100 1/4" nylon two (as shown) includes

a choice of mechanical inflator ..... \$479.95

TW-200 3/16" ..... \$399.95

For additional information, contact: Seatec, 425 W. Palmyra St., Orange, Ca. 92666.



## SUB-AQUATIC SYSTEMS — COMFORT SYSTEM SUIT

Sub-Aquatics Systems is a relatively new diving equipment manufacturing company that has recently introduced the Comfort System — an off-the-shelf, inflatable suit that comes in four different sizes for males ranging in weight from 130 to 225 lbs., and in height from 5'4" to 6'3". They also feature Comfort suits in four sizes for women ranging in weight from 100 lbs. to 145 lbs., and in height from 5'2" to 5'9". Custom suits are available for an additional \$25.

The Comfort Suit has a Talon zipper running across the back of the shoulders, so a buddy is required to help a diver dress.

The same type of fold in waterproof seal is featured on the wrists and ankles as around the neck. These 1/8 inch seals feature skin on the outside and nylon on the inside so when the seals are folded in, the smooth skin seals against the body.

A new, expandable inflator hose is located on the left side of the chest. It features a self-purging inflator mouthpiece which prevents water from entering the suit prior to blowing air through it into the Comfort Suit. And, of course, a mechanical inflator can be adapted to the oral inflation tube so air can be admitted from the diver's tank.

The Comfort Suit is available with nylon on both sides, or with nylon on the outside and skin on the inside. All seams are double-glued and pressed, then sewn only on the outside of the suit to prevent pinhole leaks. This also prevents lumpy seams on the interior of the suit.

1/4" nylon two ..... \$300.00

3/16" nylon two ..... \$280.00

1/4" nylon one ..... \$260.00

3/16" nylon one ..... \$250.00

For additional information, write to: Sub-Aquatic Systems, 530 6th St., Hermosa Beach, Ca. 90254.





## U.S. DIVERS CO. — DRY SUIT

U.S. Divers has made a departure from the norm by totally eliminating zippers in their one piece, quarter inch, nylon two, inflatable dry suit. Entry into the suit is made through the neck.

Once on, the inner nylon ring with a separate latex membrane is pulled over the head, positioned on the inside of the neoprene neck opening and then made watertight with a stainless steel clamp. The latex rubber fits snug around the neck and prevents water from entering into the suit. A standard wet suit hood is then worn over the head — a commercial diver can use a helmet.

The same type of seals are also used on the wrists. As the seals wear out or rip, they are simply replaced with new ones. It's a good idea to use soap or talc to ease one's hands through the latex seals to prevent them from tearing.

Boots are an integral part of the system. The hard rubber soles feature heavy treads to prevent slippage on wet areas.

The dry suit comes equipped with a mechanical quick disconnect inflator which screws onto the first stage of a regulator. It's the same inflator mechanism that is used on the U.S. Divers buoyancy compensator. The inflator is equipped with a push button control that is thumb activated, and located on the right front part of the chest.

A large purge valve measuring more than 1 1/4 inch in diameter is located on the left side of the chest. This purge valve is activated over any area of the valve — in other words, the center of the valve doesn't have to be depressed in order for it to operate. Standard wet suit mitts or gloves can be worn effecting a totally warm diver.

U.S. Divers Dry Suit . . . . . approx. \$329.00

For more information, write to U.S. Divers Co., 3323 West Warner Ave., Santa Ana, Ca. 92702.



## WHITE STAG WATER SPORTS — THERMAL DRY SUIT

Fifty inches of Talon waterproof zipper, running from the waist up around the back of the neck and back down to the waist, makes the Thermal Dry suit one of the easier suits to put on and take off. Although the manufacturer claims the suit can be put on without assistance, great care should be taken when securing the zipper around the back of the neck to prevent it from catching on any of the material. The suit is entered by first inserting the legs, next slipping the arms into the sleeves, then bringing the yoke up over the head and down around the neck.

Wrist, ankle, and neck seals are 1/8" neoprene with skin on the outside and nylon on the inside. For an effective seal, they are all turned in so that the smooth neoprene skin is sealing against the diver's body. When air is then introduced into the suit, it is gently forced against the fold creating a tighter and more secure seal.

A glass filled, polypropylene elbow and mouth piece with a short stretch corrugated hose allows for suit inflation and deflation. The mouthpiece also features a spring loaded dump valve for bleeding air out of the suit. The hose elbow swivels, allowing it to be positioned in any 360 degree position. Knee pads, and glued and stitched seams are featured on this Rubatex suit; all seams are backed with neoprene.

A short legged farmer john undergarment is available to be worn for added warmth. And if a mechanical inflator is attached to the oral inflation hose, the shorty undersuit would prevent a blast of cold tank air from hitting the chest when air is introduced via the scuba system.

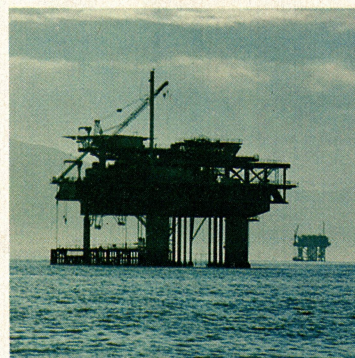
Prices are as follows:

|                                                                |          |
|----------------------------------------------------------------|----------|
| 1/4" nylon one . . . . .                                       | \$250.00 |
| 1/4" nylon two . . . . .                                       | \$300.00 |
| 1/4" nylon two with attached boots with molded soles . . . . . | \$325.00 |

For additional information, contact: White Stag Water Sports, 1046 Princeton Dr., Marina del Rey, Ca. 90291.

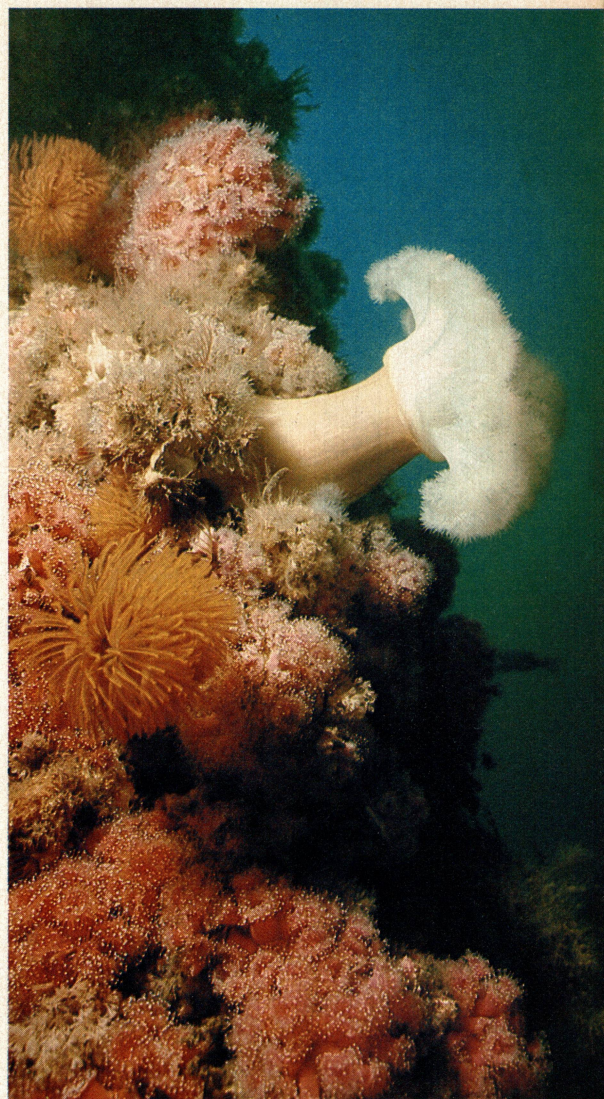
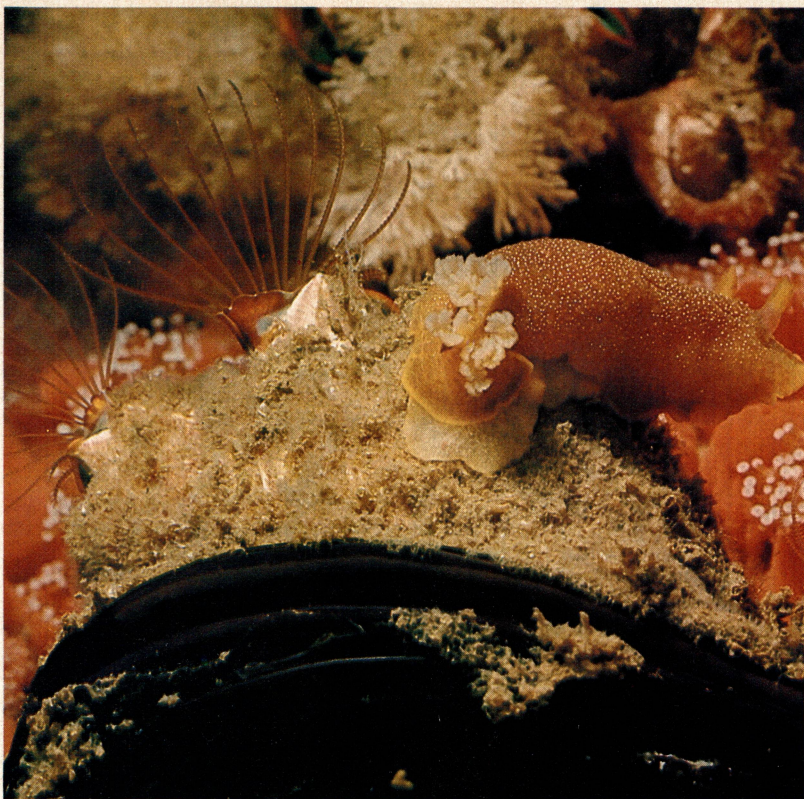


# AN OASIS IN THE SEA



**T**he Santa Barbara channel is a unique chunk of ocean. Where most of the California coast runs along more or less in the expected north-south manner, at Point Conception it takes a sharp cut to the east for about 50 miles. The towns along this east-west stretch, including Gaviota, Santa Barbara and Carpinteria, face directly south onto the California Channel Islands. By itself, the Santa Barbara Channel has never been considered as anything much more than a body of water over which to get from Point A to Point B. Dive boats cross it north to south, and navigators have steamed and sailed east and west on their way down the California coast. Most of the channel is deep and relatively devoid of life. Even in shallow areas the bottom is barren, swept by southbound currents from the Bering Sea and northbound currents from Mexico. In normal cases a diver would not choose to dive in the





*In most cases a diver would not choose to dive in the Santa Barbara Channel. An exception to this is Platform Hilda, an oasis in the sea where fish come to congregate and feed by the thousands, where nudibranchs have proliferated, where lively mussels and barnacles crowd each other for space, where different varieties of sea anemones have sprouted, urchins have colonized and corals have taken root.*

**By Hillary Hauser — Photography by Bob Evans**





channel. All he might see would be a pelagic fish or two, and suspending oneself over an unknown and unseen bottom is the fastest ticket to insecurity.

However, there is a spot in the channel which is an oasis in the sea — where fish come to congregate and feed by the thousands, where nudibranchs have proliferated, where lively mussels and barnacles crowd each other for space, where different varieties of sea anemones have sprouted in a riot of colors, where crabs creep about, where urchins have colonized, and where corals have taken root. All this life and activity is surrounded by acres of barren water and sea bottom. It is truly an isolated sea aquarium without walls, and it is known as Platform Hilda.

There are a number of oil production platforms in the Santa Barbara channel, and recently photographer Bob Evans and I were given an assignment that took us beneath Hilda. Hilda belongs to Exxon Company U.S.A. and Standard Oil of California, with SOCAL as operator. The platform is located about two miles out to sea off Summerland, California. We were to take notes and photograph what was going on under Hilda's massive gray structure, paying attention to the types of marine life that had congregated and observing where most of the subsea activity was taking place.

Bob and I were totally unprepared for what we saw. In spite of Hilda's remote location, she bustled with activity. Down to about 60 feet, on every inch of available leg space was a mussel or barnacle, very alive, very active and elbowing

each other for growing room. We most often consider both of these animals in terms of the lifeless forms we see in tidepools. Here, underneath Hilda's underpinnings, they were almost jumping around. Thousands of barnacles performed miniature fan dances as we watched, their feather-like feelers quickly popping in and out of their eye-like orifices, twisting to catch the passing plankton.

The mussels weren't as entertaining, but it was obvious that they had been as busy, because they were literally everywhere. As Bob and I observed a section of these black-shelled bivalves, we saw one of them release a milky white cloud of something. It turned out to be life in the making! What we were watching was the first step in mussel reproduction. The mollusks release sperm and eggs into the water where the two unite. The fertilized egg becomes a floating larvae, floats with plankton, and finally settles to the bottom, or substrate, where it begins its life as the typical black-shelled mussel that we know. These mollusks may not have provided us with a dance or any fancy maneuvers, but both Bob and I felt that we were experiencing something very rare as we watched this unusual bit of nature at work.

With the huge quantity of barnacles and mussels in evidence, the resident fish were having a heyday. They swarmed around Hilda's legs by the thousands. There were sea perches (white, black, rubberlip and pile perches), as well as numerous varieties of rockfish, sculpin and basses. We noticed that most of these fishes stayed in the 30-40 ft. range, and that this was where most of the subsea life was concentrated. As we went deeper the water became cloudier, darker and less inhabited. Also less inviting. At the bottom of Hilda the water is 106 ft. deep, but it might as well be 1000 feet because it is murky and a bit unnerving since you can only see inches in front of your nose. The absence of light and the presence of currents make the deeper ranges less compatible with marine life forms.

But where there was life, there was life! Everywhere we looked was some living, growing thing. In between the ubiquitous barnacles and mussels were dense colonies of club anemones in bright oranges, deep reds, shocking pinks. Here and there were heavily planted colonies of white anemones, protruding from the pilings on their long, thick stems. Even Hilda's stanchions and underpinnings were breathing, and we couldn't put our hands anywhere without squashing something.

How all this stuff got to Hilda in the first place poses some interesting questions. The prevailing theory, as offered by Shane Anderson of Western Marine Labs, Santa Barbara, is that these sessile life forms (non-traveling animals that are anchored to something) drifted to the platforms in the larval state by way of currents. Upon arrival they attach themselves and commence their adult lives. "Certainly," says Shane, "they couldn't crawl across the bottom and up the pilings." It is interesting to speculate what would happen to all of these potential animals should there not be spots in the channel on which they could attach themselves, and this speculation brings up the whole idea of the oil platforms as artificial reefs.

It has been observed that any solid thing, when placed in the ocean, will attract marine life to it and that fish and invertebrates congregate around such havens. This discovery was made just after World War II, when divers returned to wrecked airplanes and ships and found them literally bustling with marine life. The first thing that happens in such situations is that plant life, such as algae, begins immediately to grow on the foreign object. The sessile organisms that need a solid surface on which to anchor themselves come close behind and these drift to the site in their larval state. These are the anemones, hydroids, corals, barnacles, mussels and other shell forms. The little fish come next, first because of the available food supply, but secondly because the foreign object, now a reef, offers protection — cracks and crevices in which they can hide from the bigger predators which come around soon after. Even the bigger, pelagic fishes that normally stay in the open ocean will circle around such a reef in the outer waters, zooming in when they decide that it is time to eat.

California has for some time experimented with artificial reefs. In 1958 the late Charles Turner, a California Fish and Game biologist, began dumping worn-out street cars, junked automobiles and quarry rocks into the ocean to see what would happen. He found that in the midst of virtual barrenness all of the objects attracted fish and developed into thriving reef communities. Other states are building such reefs today, out of scrapped ships off Texas, out of cars and old rubber tires off Florida, and out of car bodies in Chesapeake Bay. The results have been close to startling. In the midst of subsea deserts the artificial reefs have become oases for great varieties of marine life and thousands of fish, and in fact have become popular sport fishing



areas. While skeptics have labeled the whole idea of artificial reef building as nothing but a license to dump trash in the ocean, the fact that the "trash" attracts multitudes of fish and other marine life forms cannot be disputed.

The oil platforms in the Santa Barbara channel have served as artificial reefs. While oil companies discourage pleasure diving beneath the rigs because of obvious liability, underwater scientific expeditions have been conducted around the rigs and in each case the evaluation is the same: things are hopping down there. When Hilda was installed in 1959, a Department of Fish and Game study was inaugurated to monitor consequent subsea changes. Within the first month after installation the hydrozoans had already begun to grow. In the second month, schools of sardines, mackerel and bonito had moved in. At the same time the scallops, barnacles and mussels had sprouted and were competing for space on the pilings. Nudibranchs by the thousands were depositing their eggs on the understructure. Hilda was so cluttered with different life forms that the oil companies found that they had to clean the pilings every two years, to reduce resistance of ocean currents on the structure. This cleaning practice may sound like a crime at the outset — a waste of perfectly good marine life. However, the animals that are cleaned off are instant food for the fish inhabitants, and new growth always begins immediately. If left to grow unchecked, the existing animals would eventually die and their shells or skeletons would take up space that is instead occupied by new, living things.

A diver can always expect to see a fabulous array of subsea life beneath Hilda, or any of the other oil platforms. I had to admit to Bob that nowhere, in all my years of diving off California, had I seen such an incredible concentration of such vastly different forms of life. And the types of life sometimes even vary between the different platforms. For example, on the rigs that are further out to sea in 300 feet of water, we noticed several different species of fish that did not occur on the inshore platforms. This is because the outer rigs are exposed to different currents. We were amazed to find bright orange, iridescently spotted baby garibaldi on one of the outer platforms, where none existed on Hilda.

The real treat in any diving experience comes when something totally unexpected takes place, and such an event occurred during our dive on Hilda. Bob was focusing on some vibrant red strawberry anemones when suddenly we both

noticed some bigger-than-usual fishes slowly swimming out of the gloom toward the platform. We looked at each other and looked again; there were five big ocean sunfish (*mola molas*), lazily cruising nearly as if suspended in liquid space. Their big eyes rolled back and forth, watching us as carefully as we were watching them. The *mola mola* is a strange-looking, disc-shaped fish that looks as if it had been born without a tail. "Mola" in Spanish means "mill wheel," and the fish obviously got its name due to the fact that it resembles a circular milling stone. They are not frequently seen by divers because they usually stay in the open ocean, sunning themselves on the surface and flopping away at the sight of a boat. They are shy and will flee at the slightest hint of danger, but even when they are in a hurry the *mola molas* look as if they needed swimming lessons. The alternate fanning of the dorsal and anal fin is its major method of propulsion, and the whole procedure is awkward at best.

Bob and I moved toward these strange fishes. They didn't seem perturbed. We slowed our breathing, hoping that whatever bubbles we produced would not scare them off. I extended my hand toward one of them. It didn't move. I began

to stroke its side, and it actually seemed to enjoy it. Soon we were engaged in a full-scale massaging game. I was thrilled and the fish was probably just feeling good. *Mola molas* are often plagued with parasites and the reason that they frequently jump entirely out of the water and slap their bodies on the surface is to enjoy a good scratch and to knock a few parasites asunder. They are often serviced by cleaner fishes such as the wrasses, and California blacksmiths (pomacentrids) have been seen swarming around *mola molas*, picking at their silvery hides.

The *mola molas* drifted off into the gloom, and Bob and I swam back to the platform. A huge purple jellyfish, its gigantic tentacles trailing behind, undulated by. We swam to the interior of Hilda to take an overall look at this giant underwater labyrinth. The loud hum of the wells reminded us that this huge artificial reef was actually an oil-producing rig — at the rate of 8000 barrels of crude oil and 40,000 cubic feet of natural gas per day. Hilda was no dead lady. Her inner machines were vibrating, her outer environment buzzing with life. All in all, she was, and is, a strange dichotomy of industry and nature. >>>



*In the midst of subsea deserts like the Santa Barbara Channel, oil platforms such as Hilda serve as artificial reefs attracting great varieties of marine life and thousands of different fish. Within a month after the installation of Hilda, the hydrozoans had begun to grow. Other encrusting organisms followed, as did fish, looking for food and shelter.*







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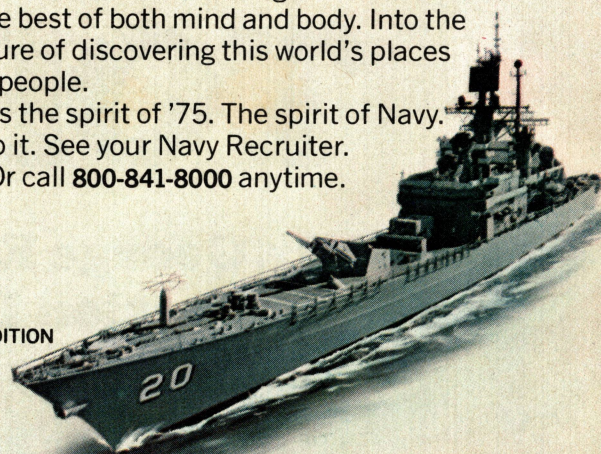
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# PAPA TOPSIDE

## Dr. George F. Bond The Father of Saturation Diving

By Bill Barada

**"W**e are in the dawn of a whole new concept of diving — it is the most significant step in underwater advancement in many, many years."

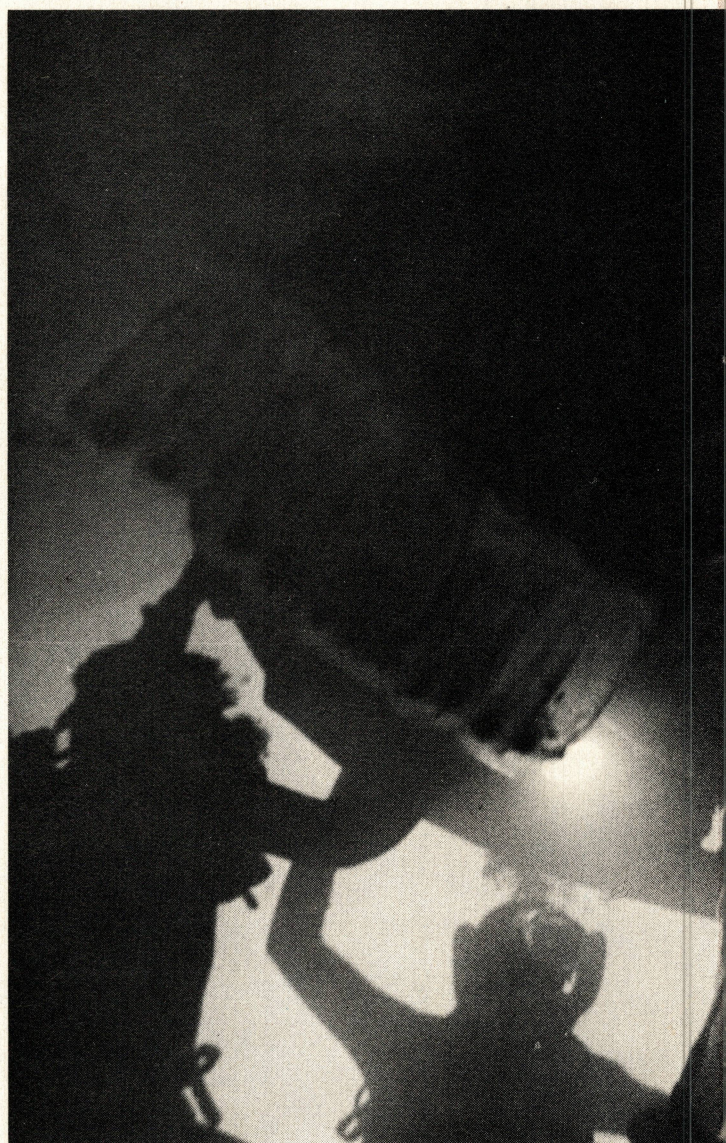
These were the words Captain Walter F. Mazzone, MSC, USN, used to describe the success of the U.S. Navy's Sealab II program off La Jolla, California, in 1965. The project was a full scale experiment in saturation diving in which each of three teams of aquanauts lived and worked for periods of 15 to 30 days, 205 feet beneath the surface of the ocean in the cold waters of the Pacific.

A name which we believe history will place high among those who have made a special contribution to the advancement of civilization is Doctor George F. Bond, Captain in the United States Navy Medical Corps. Dr. Bond is known among his colleagues as "the father of saturation diving," and the U.S. Navy aquanauts of the Sealab program refer to him affectionately as "Papa Topside."

Dr. Bond's work in developing, testing and proving the concept of saturation diving paved the way for men to live and work for indefinite periods at fantastic depths on the sea floor. His formulas for exotic gas mixtures and decompression times opened the way for man's invasion of the deep water covering the earth's continental shelves and gave us access to the vast resources of this submerged world. Thanks to Dr. Bond's foresight and determination, petroleum companies today are pumping oil from the continental shelf at depths of 1000 feet and are planning 2500-foot wells in the future; undersea mining companies are preparing to harvest manganese nodules and other minerals from the sea floor, countries suffering from water shortages or severe water pollution are finding fresh water springs deep beneath the surface of the sea; and scientists are utilizing saturation diving to study marine ecosystems in preparation for undersea farming and aquaculture.

Dr. Bond is quick to point out that the concept of saturation diving is not original with him. He says the idea — that a person whose body tissues have become saturated with gases at a specific depth and pressure can continue to work at that depth for indefinite periods without worrying about decompression until the entire mission is completed — has been around a long time. A legend tells of English miners who left cart-pulling ponies under pressure inside a caisson instead of decompressing them at the end of each working day.

The legend may, or may not, be true. It remains that Dr.









Bond is the person who spent years in meticulous research and testing in order to develop data and formulas which made deep saturation diving a practical reality.

His accomplishments are even more remarkable because, as an officer in the U.S. Navy, approval of his project had to be cleared through the ponderous organizational red tape and political jungles of the Naval bureaucracy. The saturation concept is the first major breakthrough in deep-diving technology since J. S. Haldane's decompression tables were adopted around 1905. Apparently the collective shortsightedness of the bureaucratic decision-making process has not changed much in the Navy since Billy Mitchell publicly demonstrated that an airplane can sink a battleship — and caught the anti-airpower admirals with egg all over their faces.

In his Sealab II chronicles, Dr. Bond writes, "It strikes me that the whole story of Sealab has been a tale of difficult escalation against seemingly hopeless odds. In 1957, my first proposal was rejected with a curt official remark that it was worthless, ill-conceived, and impossible of accomplishment; and I was finally admonished to knock off such thoughts and work on matters of operational importance . . . or else."

At the time, 1957, the Navy's underwater work was so inefficient that it was hopeless to attempt a working dive deeper than 200 feet for longer than 30 minutes because the decompression penalty was too high.

Dr. Bond goes on to say, "In the years that followed, and led ultimately to Sealab I, only three of us had faith; CDR Robert Workman, Capt. Walter Mazzone, and myself. We fought the system and the odds; but it was good because we had to hold to the tightest experimental designs, and re-examine our motives every day . . ."

Largely because these men had faith and were willing to fight the "system" against seemingly hopeless odds — the U.S. Navy today has diving capabilities to 1000 feet and in the near future will be working at the fantastic depth of 2500 feet.

Only a thoroughly unselfish and dedicated person would risk his future and his career by bucking the military system, and the world's diving community is fortunate that Dr. Bond was just that kind of man. His motivation was certainly not money or profit. The commercial diving companies and other industrial enterprises have reaped most of the benefits.

Dr. Bond's willingness to accept a unique challenge and his indifference to financial rewards were demonstrated early in his career. He grew up in a backwoods Appalachian community about 15 miles from the tiny village of Bat Cave, North Carolina. Dr. Bond says, "It was a rural community surrounded by about 450 square miles of rugged mountain terrain inhabited by about 6000 people. The area had no phones, virtually no roads, and no doctor — so most of the people spent their lives without any kind of medical attention."

When George Bond left the area, he promised to return and build a community hospital. He kept that promise. From 1946 to 1953 he served as the only doctor these people had ever known. He traveled the area in a 4-wheel-drive jeep, averaging 200 miles a day over rugged mountain trails, some of which were so steep that even a mule would balk. He practiced medicine that Dr. Bond says, "included some treatment which probably shouldn't have been done at home."

He built the 16-bed Valley Clinic and Hospital which is the smallest general hospital in the nation. He contrived to have students from a medical school sent to his clinic to work and learn, and he trained hospital help and nurses which he says, "did everything." Gradually the mountain people developed confidence in their doctor and they learned to trust him enough to come to his clinic for treatment.

This is characteristic of the people George Bond has influenced over the years. His leadership develops a fierce loyalty and a confidence in his judgment that has followed him from Bat Cave, all through the Navy Sealab program, and is prevalent in his work today. In 1965, while discussing preparations for Sealab II with 15 aquanauts, I asked about their apprehensions as guinea pigs in a dangerous diving experiment. Cyril "Tuck" Tuckfield answered with, "I'd gladly go through hell if

George Bond or Walt Mazzone said it was O.K." All 15 divers nodded in agreement, and added that they could speak for every aquanaut in the program — they all felt the same way."

Many patients of the Bat Cave, Valley Clinic and Hospital, owe their lives to Dr. Bond's willingness to do battle with "the system." North Carolina Law prohibits transporting indigent patients across county lines for treatment. Bat Cave is located at the juncture of four counties, and most of its hospital patients are so destitute that payment is more often made in pigs, chickens, garden produce, or moonshine whisky than in money. Dr. Bond says, "The law made treatment of special cases very difficult."

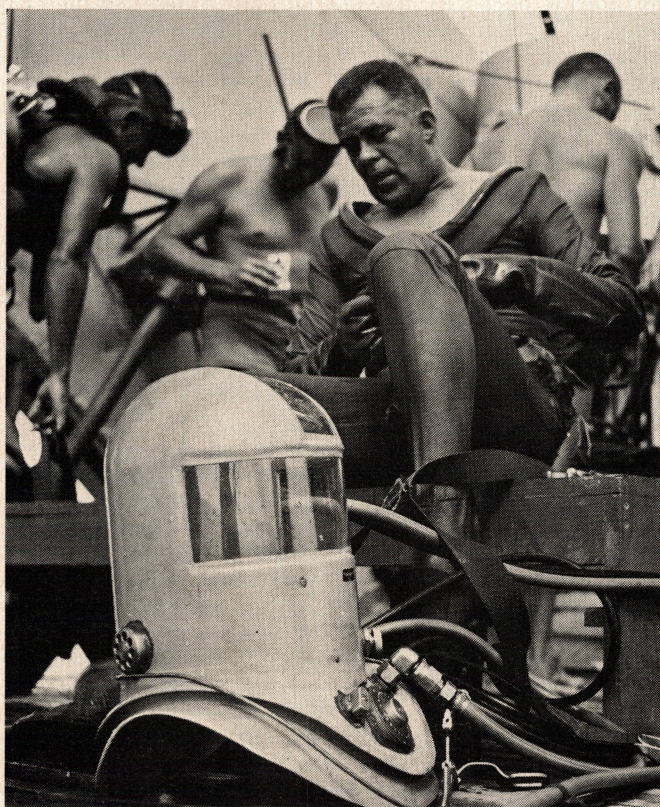
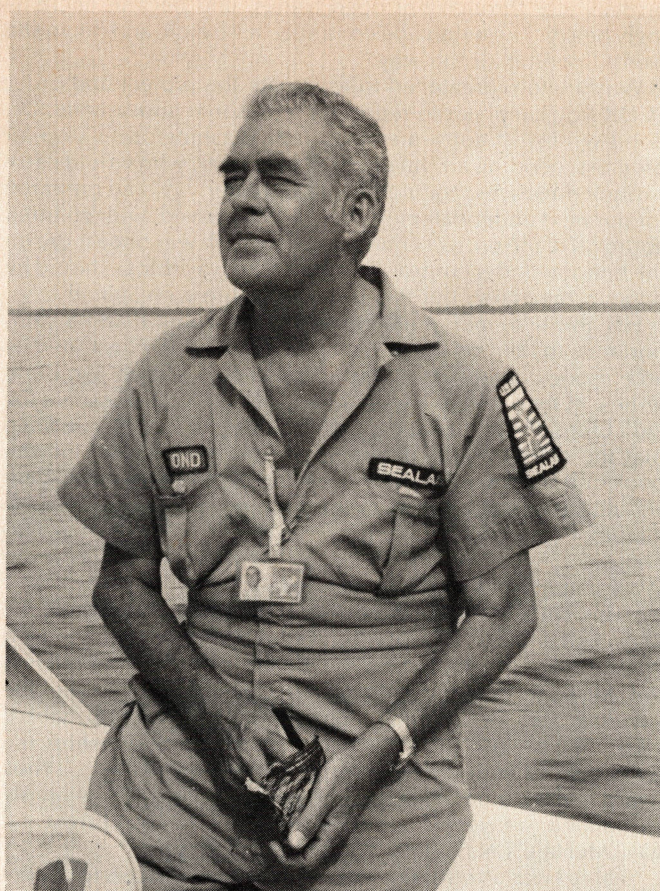
However, he managed to transport some of his difficult cases 19 miles over dirt roads to the hospital in Hendersonville — other special treatment patients were taken by bus to Duke University and admitted as "teaching cases."

Dr. Bond's military service began as a member of the Army Reserve, Medical Administrative Corps while he was in medical school. He was offered a commission after internship but said, "The Army requested too many waivers and I declined the commission." His refusal was noted by the Army, and Bond mistakenly thought he was out of the service permanently.

The Korean War changed that, and launched him into an entirely new career. A telegram ordered him to report to Fort Sam Houston, Texas, for military service in the Army. Then, after a few days, word was sent down from Washington that the whole thing was a mistake, the Army didn't need any more doctors. However, the military rarely, if ever, admits a mistake. Dr. Bond was not sent back home, we was given the choice of serving in either the Air Force or the Navy. Dr. Bond says, "I knew nothing of either service, so I picked the Navy Submarine Service because it had the highest pay schedule. I had no idea that diving or scuba had anything to do with the extra pay. I was ordered to deep sea dive school the next day —







The top left photo shows Dr. Bond with one of his patients from the backwoods Appalachian community of Bat Cave, N.C. The lower left picture shows Papa Topside in a 300 foot buoyant ascent — note the shark waiting near the surface. Though D. Bond acquired his nickname because of his diving ability, his introduction to diving resulted from military snafu.

and loved it right from the start." Thus, Dr. Bond's introduction to diving, and his subsequent development of saturation diving, is the result of a military snafu.

Dr. Bond did not become "Papa Topside" because of a lack of diving experience or ability. He is a diver's diver who can snatch lobsters and skin dive with the best. While I was photographing Sealab I in 70 feet of water off Panama City, Florida, Dr. Bond appeared wearing nothing but a bathing suit and no equipment other than mask and flippers. He posed for pictures at the shark cage, then leisurely entered the lab. My estimate of the time of his breath-hold dive was two minutes.

He practices the 100-foot-drop in the training tower at New London at every opportunity and has been timed breath-holding at immersions of more than three and a half minutes.

Dr. Bond and Cyril Tuckfield made a buoyant ascent (with no breathing apparatus) from a submarine submerged in 322 feet of water. The deepest previous free ascent was from 130 feet which was considered the maximum safe depth because it was believed that the rapid compression required to remain within no-decompression times would create heat that would burn the diver's lungs. Dr. Bond and Dr. Workman calculated the times required for deeper ascents, then characteristically, Dr. Bond tested his calculations himself.

In 1975, when he was 60 years old, Dr. Bond made two 60-foot breath-hold dives in the Navy's new Ocean Simulation Facility—each time breath-holding three and a half minutes.

His deepest skin dive was on Sealab II which he describes in his chronicles. He says, "The SDC came to a halt at about 160 feet of depth, which meant a long breath-holding swim of about 90 feet before we (Bond and Capt. Walter Mazzone) could reach the shark cage and enter the hatch to the house. I went first, after a last deep breath from the air of the SDC.

"The swim was beautiful, but at first a little frightening. This was certainly the deepest breath-holding skin dive I'd ever made, and possibly the deepest in history." (The habitat was in 193 feet of water.)

Repeated military snafus threatened to sabotage the entire Sealab program and his success in launching the project was accomplished in spite of Navy protocol and tradition, not because of official support. It is probable that other divers would eventually have developed and proved the saturation concept of diving, but it required a man of George Bond's caliber and temperament to manipulate and maneuver the program through the U.S. Navy.

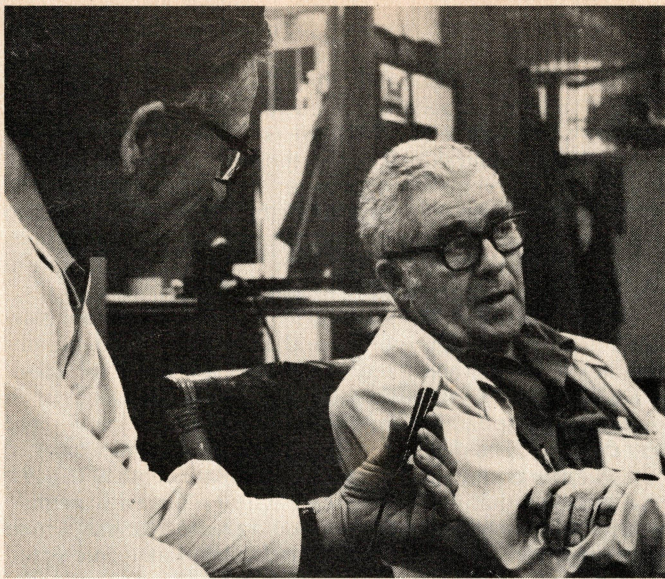
George Bond's training as a backwoods country doctor is revealed in his "can do" approach to both diving problems and the obstructionism of bureaucratic red tape. As the only doctor in an area of 450 square miles and with the welfare and lives of 6000 people dependent on his decisions, there was no time for procrastination, no room for excuses, and no moral support or back-up from a board of directors or "committee of superiors." If anything was to be done, Bond had to do it. And self-reliance became a way of life.

The Navy's rejection of his saturation diving proposal was based on an overall consensus that he had not shown a need for men to work on the continental shelf at depth for long periods. Dr. Bond did not accept either the rejection, or the opinion of his superior officers. Quietly and unofficially, he and his Executive Officer, Dr. Workman, began experimenting with animals in the chamber of the New London Submarine Base. They were forced to use borrowed funds, animals and equipment "liberated" from other programs.

Dr. Bond's eyes sparkle when he talks about this phase of his investigations. He says, "We accomplished astonishing things — revolutionary things." At a time when 50% of the world's physiologists believed that nitrogen was essential they demonstrated that nitrogen is not needed in breathing mixtures. They managed to keep animals at a simulated depth of 200 feet for two weeks — then brought them safely back to the surface.

Eventually the Secretary of the Navy for Research and Development, Dr. James Wakefield, became interested in their work and requested that the proposal be resubmitted — and to make sure it reached his office. Dr. Wakefield personally





approved the research, and the experiments were officially sanctioned as Project Genesis.

The chamber research continued for seven years. First with animals, then with human volunteers. The volunteers were tested at all depths, including 100 and 200 feet for 14 days, with data recorded from more than 100 physiological tests on each individual, each day. All were normal and saturation diving was ready for an open ocean test. The Sealab program was born, and military-political maneuvering began a never-ending harassment. Dr. Bond does not mention it in his chronicles or in conversation, but others have stated flatly that official approval of the open-ocean run of Sealab I was deliberately withheld so that others could capitalize on the glory of being "first" to successfully live and work on the sea floor.

The data generated by Dr. Bond's work in Genesis were routinely sent to Washington and released as public information to any industry or group that cared to use them. It was the heyday of oceanography. Space exploration was in full swing. A federally funded "NASA Of Inner Space" was predicted. Big government contracts were at stake and the competition to be first in the race into the sea was at its peak. Industry-sponsored saturation diving experiments sprang up in Europe, America and Hawaii, and deep diving chambers, diving bells, and submarines with diver-lockout capabilities were entered in the race — and all were utilizing the formulas, decompression times, and other data developed by Dr. Bond in Genesis.

Jacques Y. Cousteau openly admits that his Conshelf project in the Mediterranean would not have been possible without Dr. Bond's research data. He also told me that he decided to go ahead with saturation experiments because it was uncertain when, if ever, the Navy would authorize open-ocean testing.

Others were not as candid as Cousteau and to this day their publicity releases imply that saturation diving was originated by their company. As a result, Dr. Bond, Dr. Workman, Capt. Mazzone, and the Navy aquanauts stood by helplessly while others made history with their hard-earned research data.

Even after the Sealab I project was eventually approved, it was funded by a pinch-penny budget and plagued by incompetence and lack of support from surface personnel. The troubles began with its experimental placement in 70 feet of water off Panama City, Florida. Dr. Bond describes some of the incidents in his Sealab I chronicles.

He wrote, "Next day we prepared for the drop — the process of lowering the habitat to the ocean bottom. A seemingly simple exercise, this burgeoned into a nightmare . . . . When the outboard lines were released, Sealab commenced to sink with the bottom hatches open. Desperately we raced to catch her on the nylon; but, as in the case of ladies' nylon hose, the line stretched interminably. As Sealab sank further, she took

on seawater through her open trunks, and became increasingly heavy. The nylon line continued to stretch, and down she went, flooding all the way."

Washington threatened to terminate the project and order LCDR Roy Lanphear to report for a personal appearance. Dr. Bond writes, "I got a message from Washington to stop all progress, pending arrival of LCDR Lanphear, who would carry explicit directives. Naturally, we got underway, and prepared for our next underwater test. When Roy arrived, with guarded approval of the project continuance, Sealab was once more on the bottom, under control. This is not the way things should be done in the Navy; but this is a way of life with Sealab I."

His ability to manipulate bureaucratic opinion and his importance in holding the project together was demonstrated by an episode that occurred while he was on vacation. Dr. Bond writes, "Once my back was turned, all hell broke loose on the Hill. Our self-appointed experts in numerous bureaus decided that the operation, as planned, was too hazardous, and the book must be rewritten. The aquanauts, some genius decided, should be decompressed in the submersible decompression chamber; my schedules, so carefully rechecked by the 800 computer, wouldn't do at all; the show must be run from Washington; and so on — ad nauseum.

"This situation was, of course, intolerable. I cut short my leave and enplaned for Washington to do battle. Once arrived I found to my great relief that the decisions just recounted had not yet been committed to official stationery. This was the saving grace; for although a bureaucrat will reverse a verbal commitment with the speed of a waterbug, he worships the written word with the devotion of Omar Khayyam . . . . They heard and became believers. The project would go essentially as planned; we were in harmony, and the world was bright and gay. McHale's Navy had won another battle."

Sealab I was a continuous battle to prevent officers in charge of surface operations from aborting the project. Although the divers were dedicated to its completion and more than willing to take the necessary risks, surface personnel had no such interest. To them Sealab was a high risk experiment of minor importance which could be a blot on their record that might adversely affect their career. Dr. Bond wrote, "The aquanauts and topside Sealab I personnel, including myself, have felt almost from the start that our surface support team was consistently seeking excuse to abort the mission; and the completely negative attitude which we face is an unpleasant curtain which must be pushed aside hourly."

Surface support teams managed to: smash a whaleboat into the deck of the support vessel, claimed the crane was damaged beyond repair and Sealab could not be lowered, partially flooded Sealab, refused to attempt lowering in rough seas as too risky, and, after the habitat was lowered to the bottom by the giant crane atop the Argus Tower, broadcast a dire forecast of impending doom to the aquanauts on the bottom because a hurricane watch was posted in Bermuda.

Dr. Bond and the Sealab team fielded the cries of "let's abort" either by finding logical answers, or by ignoring them. Dr. Bond's concern for the welfare of the aquanauts earned him the affectionate title of "Papa Topside." He noted the nickname in his chronicles with the following entry, "Incidentally, I am again a papa. Back in the days of Genesis, I was Papa Gen, and my subjects genitalia. Here, I am Papa Topside, or occasionally Seapappy. So much for a name."

At one point, after a particularly gloomy forecast from the surface support commander, the aquanauts in Sealab responded with, "Papa Topside, for Christ's sake, give the S.O.B. a handful of tranquilizers, and send him below. Since this project started, we've heard nothing but 'can't do it', 'can't help it', and 'can't stand it'. Tell him to cut the blankety-blank umbilical and run for shelter. We can blankety-blank well take care of ourselves."

Dr. Bond's chronicles disclose that he clearly understood the cause of the problem. He wrote, "This project has never pretended to be a safe one; and I thought this clearly under-



stood from the beginning. Yet I mistakenly assumed that competence of surface handling gear and crew would be at least equal to that of the two investigators who will carry the entire load of responsibility while the aquanauts are on the bottom. But, whereas by training, we are prepared to accept this particular type of burden, our line support team is not — and thus the dangerous conflict."

In spite of such negative attitudes and conflicts, Sealab I was completed and acclaimed as a success. (S.D. Nov. 1964)

Similar conflicts plagued Sealab II off La Jolla one year later. Regarding a last minute demand for detailed paper work justifying program features Dr. Bond had thought to be accepted fact, he wrote, "It is because of the ultraconservative, nihilistic attitude of many people in the Navy that diving practices and capabilities made no appreciable progress during the past 25 years. Now comes our program, and the backsliders set into it with a vengeance. Perhaps it is because it shows up their own unimaginative program. Surely the oldest and most damnable ploy in the world is to scream 'unsafe' at the very last moment before an operation. This will (1) stop the program; (2) make the crier seem wise in event of a minor or major casualty; or (3) afford an opportunity of saying 'beginner's luck' if the show comes off O.K. Anyway, the investigator (Dr. Bond was chief investigator) can't win. I've seen this trick too often and hate the self-seeking show it demonstrates."

Sealab II survived the bureaucratic ineptitude and conflicts of authority, resulting in a whopping success. (S.D. Jan. 1966) Sealab III was a different story. (S.D. April 1969)

Sealab III was planned to put divers at a depth of 600 feet for periods of 15 to 30 days off San Clemente Island, California. It was funded for more than \$10 million, supported by massive publicity, and ended in a tragedy which served as an excuse to abort and abandon the entire program.

The major difference between Sealab III and its predecessors is that the Navy bureaucracy took charge of the operation with all decisions and procedures emanating from Washington. The experienced Sealab personnel were shunted aside, and the result was a long series of failures that ended in total disaster. A few examples are: a basic rule followed in early Sealabs was never made a through-hull penetration above the bilge. This is predicated on the principle that an inverted water glass can't leak. The Sealab III engineers ignored this rule and designed 72 hull penetrations above the bilge. A total of 27 of the 72 failed under actual operating conditions.

Helium will penetrate materials seven times more readily than air. Yet some engineers worked on Sealab III who knew nothing about helium. As a result, a helium block was removed from the umbilical, sea water penetrated, blew the casing, and shorted out everything in the entire 1000-foot-long umbilical.

Surface operators dropped the pot, made parts out of wrong metals, made misfit parts, and designed bad seals for fittings.

Some of the aquanauts told me, "When you see these kinds of stupid mistakes being made and complain, they tell you to shut up. This destroys morale."

Tragedy struck when Berry L. Cannon, one of the first three aquanauts to dive on Sealab III, went into convulsions and died before he could be rescued.

The project was aborted and the habitat was towed to shore and mothballed — supposedly to be retained in storage while problems were studied.

However, within two weeks after mothballing, the seals were broken and its highly specialized and valuable equipment and instruments were cannibalized. The stripping apparently was condoned, or at least it went unmolested, until finally even the stainless steel pipes were cut out with a power saw, and port holes were removed for souvenirs.

Today there is nothing left of the Navy's \$10 million dollar dream of "Man-In-The-Sea" except a rusted steel hull that is too costly, and too useless, to cut up for scrap or tow to sea for the deep six. Like a ghostly skeleton, its abandoned hull sits idly by to forever haunt the bureaucrats who finally won the

battle and scuttled Papa Topside's dream of U.S. Navy aquanauts successful invasion of the deep ocean floor.

All was not lost, however. It is impossible to kill a good idea and Papa Topside's dream is still very much alive. It lives in the ex-Navy aquanauts who received training and enthusiasm from his ideals. It lives in commercial diving, offshore oil, and oceanographic research. And it lives through young divers such as 19-year-old Mark Benson, who won the 1975 Our World Underwater scholarship award. Mark Benson is Dr. Bond's godson, and his mother was a public health nurse who worked with Dr. Bond in caring for the people of Bat Cave.

Thus, the story swings full circle, back to its beginning. America should cherish its Papa Topsides. They are a rare breed to which the diving community and the nation owes a debt of gratitude.

Dr. Bond is still a Naval officer, assigned as Special Assistant to the Commanding Officer for Diving Research as the Naval Coastal Systems Laboratory in Panama City. The old Sealab I hull sits offshore in 60 feet of water, and Dr. Bond is so busy with new research projects he has no time for interviews. As usual, the material for this article was obtained while he was "on the run" between projects. His loyalty to the Navy has not diminished, his enthusiasm for diving is still evident, and the loyalty of his associates is as fierce as ever.

He is still battling "the system" and disturbing his superiors with farsighted forecasts and proposals for deep diving research that do not fit into bureaucratic schedules. He says the world will begin running out of helium in about 50 years. The gas cannot be manufactured with any degree of satisfaction, and the only logical substitute is hydrogen. However, we know practically nothing of the effects of breathing this gas. And, if we wait for 30 years before saying, "My God, we have no more helium" it will be too late. Hydrogen is not an inert gas. It combines with other substances, and research on its effects as a breathing gas should be initiated immediately.

Dr. Bond's dream, described to me during Genesis in 1960, is a nuclear research submarine equipped for deep saturation diving. He says it should be modular, with replaceable habitats for different uses such as geology, biology, and other studies. Such a mobile laboratory could go anywhere in the world, sit on the shelf, while scientists lock out to do studies, then decompress on the trip home. He states that universities cannot afford to invest in such a project, the Navy can't justify it strictly for military research — but by combining all disciplines, as in the conquest of outer space — the project would more than repay its cost in direct economic benefits.

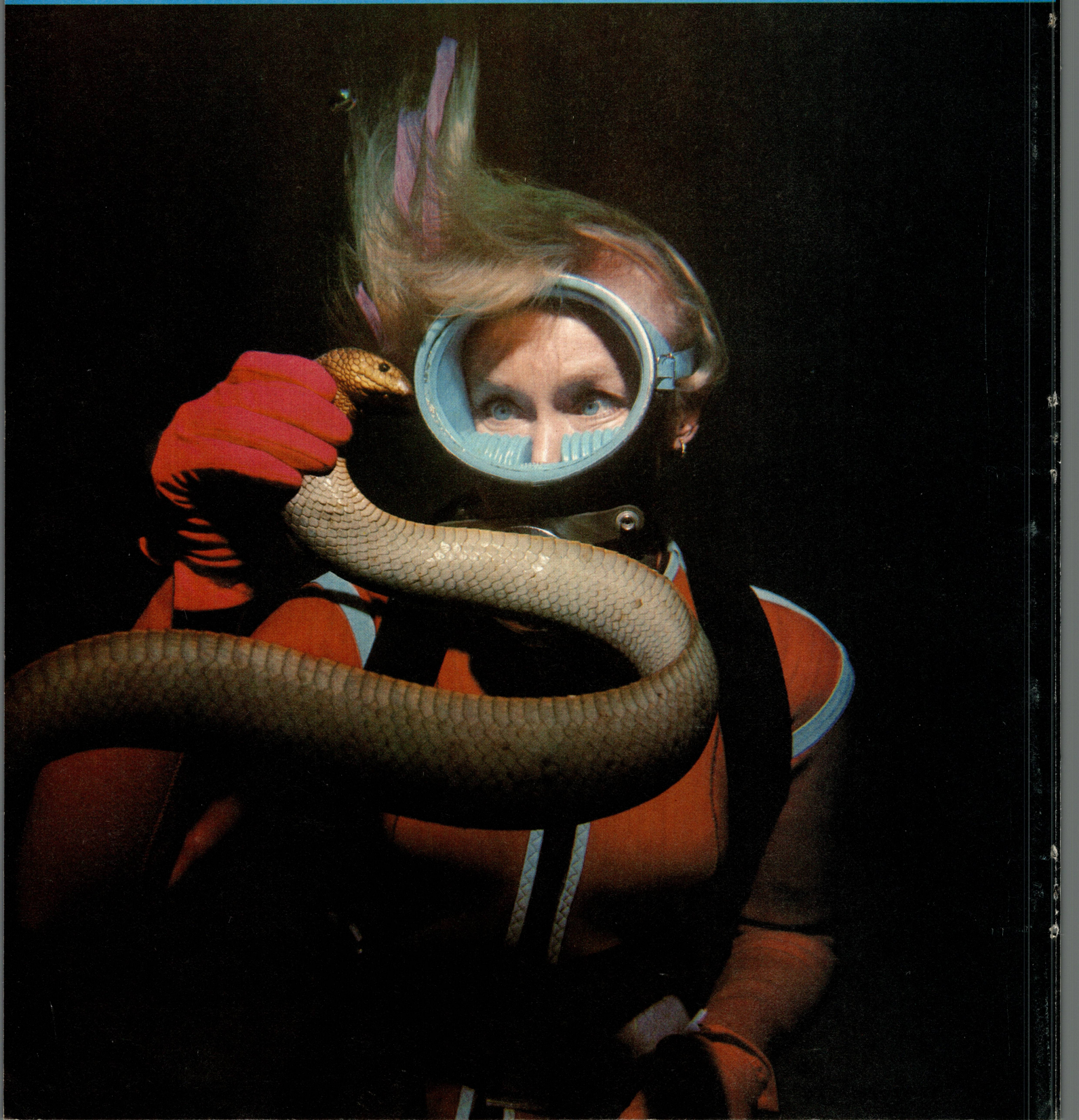
This is the legacy of Papa Topside. A vision of unselfish dedication to research for the advancement of civilization throughout the world. >>>



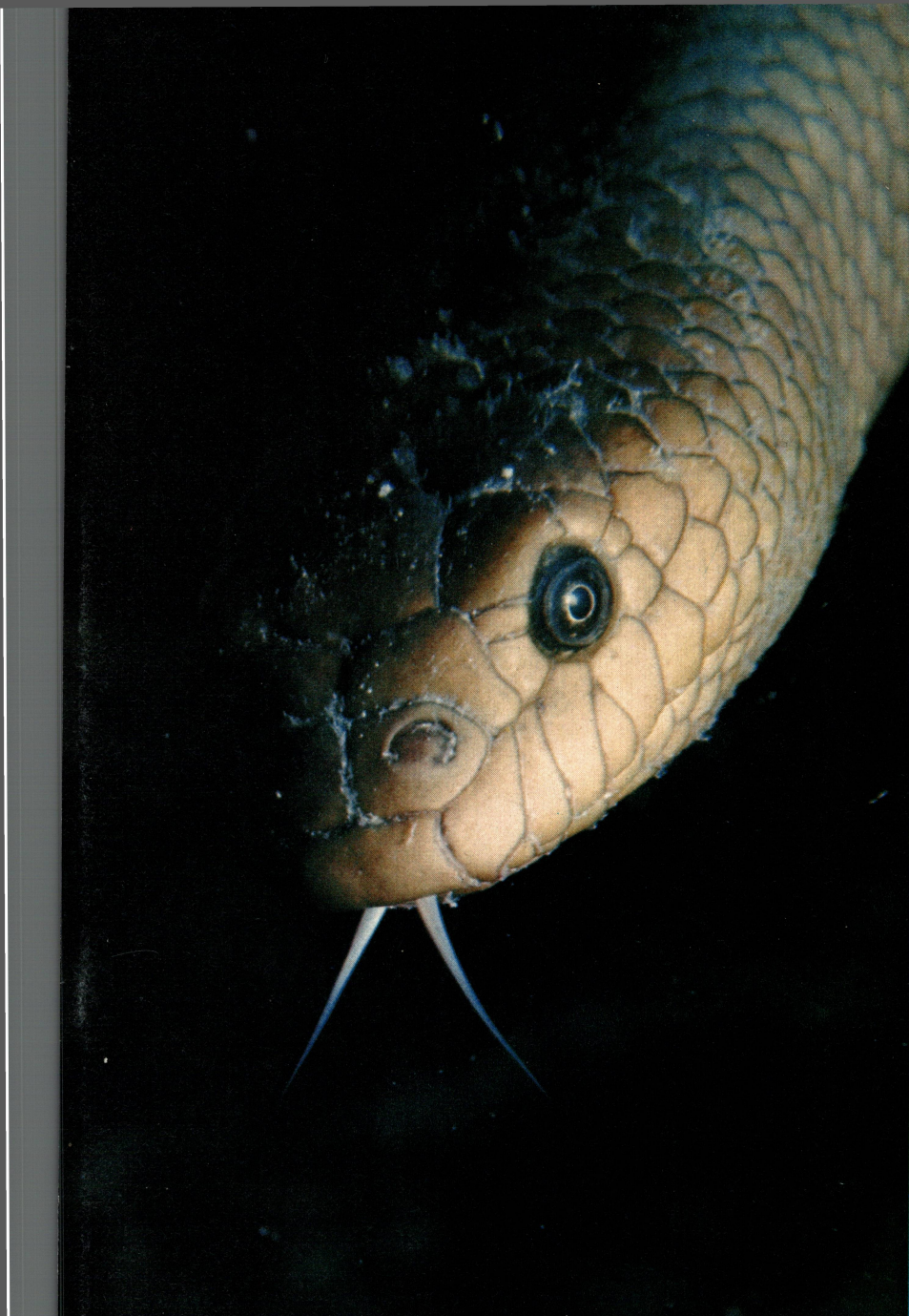
photography by Bill Douthett



# Ocean Gallery







# Sea Snakes

By Valerie Taylor

The water is warm and clear. Thousands of brilliant fish waft like jewels in the surge.

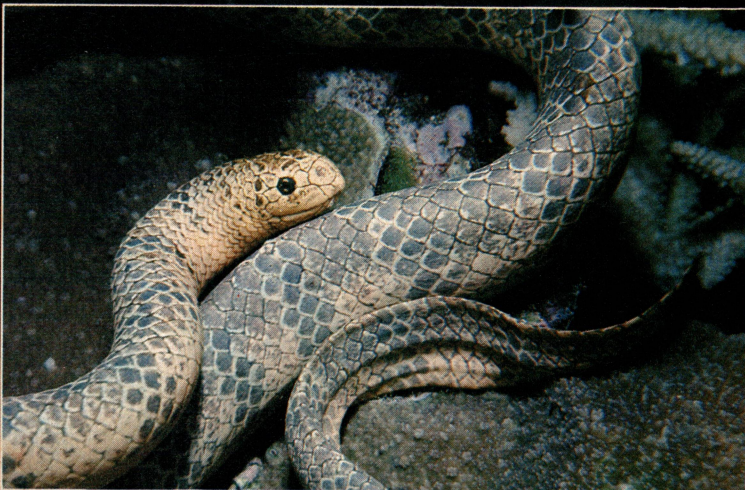
A large grouper watches with popeyed wonder as you drift past his coral cave. It is a diver's paradise, a Garden of Eden, as yet unchanged by man's destructive hand. Something gently touches your leg. You pause, the touch continues. Without alarm you turn. Horror overwhelms you. The serpent has entered the Garden of Eden — in fact, he is twined lovingly around your leg.

Well, don't worry, it's only a sea snake, and Australia has millions of them. What's more, unless provoked, they are among the most easy going, gentle creatures on the Great Barrier Reef. So far, about eight species from the family Hydrophiidae have been found in Australian waters. They range from Sydney northward through the entire Indo Pacific area. Their venom is, drop by drop, ten times more potent than that of their cousin the cobra. Their short fangs are situated well back. The venom is released only if the snake wishes it so. Generally he does not bother.

There has been only one death in Australia due to a sea snake bite that I know about. It happened when a fisherman trod on one in shallow water near Cairns. Asians who hunt sea snakes for food are killed more frequently, but skin divers really have little to fear provided they remain calm. If a snake becomes too bothersome, take him gently around the neck and tenderly carry him over to your buddy. Generally he will cheerfully turn his attentions to this new curiosity leaving you in peace.

Their bodies are similar to that of a land snake — only the tail is flattened to enable them to swim. They breathe air but appear to need very little surfacing — and can remain submerged for two hours or more. At night they commonly sleep on the bottom, their little mouths tightly shut but their lidless eyes ever open.

They are part of Australia's marine world, and the Barrier Reef would simply not be the same without them. >>>



photography by Ron and Valerie Taylor



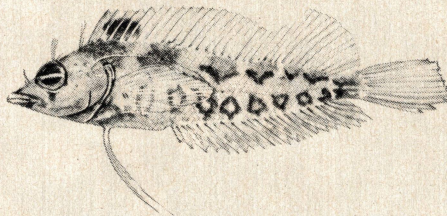




## The Diamond Blenny

(*Malacoctenus boehlkei*)

The diamond blenny is one of the lesser known Caribbean fishes, and on the ichthyological scale of fame it probably ranks somewhere around the bottom. Many references don't list the fish at all, and what is known about it is sketchy at best. Still, there are enough available facts to draw a reasonable portrait of this subsea character. □ The diamond blenny is classified by ichthyologists James Bohlke and Charles Chaplin as a member of the clinidae family of blennies. Blennies are divided into at least three species; the clinids have fixed, conical teeth as compared to the blenniids, which have a row of close-set, comb-like teeth. Within the clinidae family is the species *Malacoctenus*, always strikingly marked and readily identified by color pattern. The diamond blenny is a handsome fish, with males differing in coloration from the females. Probably the most distinguishing characteristic of both is the blotch on the spinous dorsal fin. While the diamond blenny most closely resembles *M. triangulatus*, or the saddled blenny, the dorsal blotch of *triangulatus* is at the base of the fin rather than midway out. The overall body coloration of the diamond blenny male is pale, with the ventral area lighter than the rest of the body, almost white. The horizontal dark markings are blackish, the head a brownish yellow. There is a second, horizontal row of dark, white-centered diamond shapes which give the fish its common name. In the female the characteristic dark markings are lighter—a brownish orange. The head is orange, and the lighter body color tinged with orange. While the colors are vivid in both males and females, all of the *Malacoctenus* species manage to blend into their surroundings. Victor Springer, cur-



Note dorsal fin

ator of fishes at the Smithsonian, points out that blenniids are often able to alter their color patterns depending upon their emotional states, paling being a response to a fright situation. □ The diamond blenny occurs in a variety of shallow-water habitats. Although Bohlke and Chaplin took them primarily from patch reefs, the fish is also known to live in corals on limestone bottoms, around coral reefs and in grass beds. Divers have reported seeing them within the tentacles of sea anemones, which indicates that the fish

enjoys the same sort of toxic immunity as the well-known anemonefishes of the South Pacific. Springer states that scientists have found four Caribbean *Malacoctenus* species that live with anemones, *M. boehlkei* being one of them. In this symbiotic relationship the fish builds up a toxic-re-

sistant slime over its body which protects it from the poison. It attracts other fishes into the deadly tentacles and then shares the spoils with its stinging host. The diet of the diamond blenny is believed to be primarily carnivorous. Ichthyologist John Randall suggests that clinids eat crabs, gastropods, shrimps, and amphipods. □ Perhaps one reason for the scanty history of the diamond blenny is its limited distribution; Bohlke and Chaplin say it is known only from the Virgin Islands and the Bahamas. The two scientists found the fish between 25-70 feet, with some individuals taken from less than 10 feet of water. For the most part the fish stays on the bottom, perched on its strong pelvic fins. Since the tentacles of the anemone provide the diamond blenny its shelter and food, whole business of survival would seem somewhat easier than it is for the many other fishes that must forage for a living. >

*Photo By Jack McKenney-Text By Hillary Hauser*

Photograph taken by Jack McKenney in 70 ft. of water off Grand Cayman Island. McKenney used a Nikon F, 55mm lens, Oceanic 2001 strobe, Kodachrome II, 1/60 sec., at F11, 15 in. from subject.





# MYSTERY WRECK AT THIRTY- THREE

## FATHOMS

By Thomas Roach

**A**t 10:23 p.m. on December 1, 1942, the first of two unrelated sinkings took place in the icy arena of the north Atlantic. A 3750 ton Greek freighter, the *Ionnis P. Goulandris*, in convoy on a voyage from Virginia to Maine with a cargo of coal, collided with the Panamanian steamship *Intrepido*, approximately 11 miles east of Asbury Park, New Jersey. With the vessel taking water and settling rapidly, the crew radioed for assistance and then abandoned ship, to be picked up by the damaged *Intrepido* waiting nearby. The last view ever seen of the *I. P. Goulandris* was that of the still-brightly-burning masthead lights, slowly disappearing beneath the disturbed surface of the ocean.

Twenty-one months later, on September 21, 1944, unbelievably in almost exactly the same area of the ocean, the second sinking passed into history. The 1700 ton Chilean freighter *Choapa*, sailing in convoy on its last leg of a journey from Valparaiso, Chile, to New York with a cargo of sugar, was struck by the 5090 ton British tanker *Voco*, that was part of an outbound, allied convoy that had just departed from the hectic, wartime port of New York. Two hours after the collision, the *Choapa* slid to her grave beneath the sea.

World War II would grind to its end and almost three decades would elapse before these twin casualties would set the stage for the divers from Eastern Divers Association to journey to the foreboding area of New Jersey's infamous Mud Hole and plunge into its cold depths in an attempt to positively identify one of these historic vessels as the wreck known locally by the nickname *Junior*. Thirty-three fathoms beneath the rolling surface, the *Junior* had become one of the mystery wrecks of the Jersey Coast. Few divers had ever visited her dangerous decks, and none could say positively which vessel — the *Goulandris* or the *Choapa* — lay shrouded in that cloak of dark anonymity.

On our previous trips to the *Junior* nothing of any historical importance had been recovered that could provide us with a clue as to her identity. After devoting a considerable amount of discussion and thought to the matter, we decided to try to compare the major distinguishing characteristics of the wreck with extreme blow-up, topside photographs of the two vessels. This method had been used successfully in the past by East Coast photographer, Mike DeCamp, during his identification of the Brazilian freighter *Ayuruoca*, a wreck that for years had gone under the alias *Oil Wreck*.



Feeling that we still needed more information concerning the ships, I contacted the United States Navy and Lloyds of London who, although they tried to be helpful, could supply me with only the barest details concerning the casualties. I then contacted Mrs. Jean Haviland of Baltimore, Maryland, an old friend who has perhaps the finest collection of maritime reference material in the country. From her I received detailed background information on both vessels and advice as to which parts of the wreck to compare with the photos for positive identification.

Knowing now what had to be done, I began the final step of organizing a diving team to attempt this venture when one of the divers, Gary Gentile, came to me with an idea that at the time seemed outrageous. He suggested that we try to recover the entire helm and stand that had been seen on the bridge during our previous dives. The difficulties of such an operation at a depth of 195 feet, with the critical time limit involved, seemed insurmountable. We agreed that the task might be possible and was definitely worth the effort, for more than likely there would be a legend of sorts inscribed somewhere on the stand that would document the wreck. Armed with the newly-gathered reference material and instilled with a shaky optimism that we could complete this recovery, we waited for the fickle Atlantic Ocean to favor us with sailable weather.

After selecting an experienced deep-diving crew, we departed late in the winter of 1973 during the cold, gray hours of the early dawn, aboard the charter boat *Sea Lion* out of Brielle, New Jersey, and steamed a little over 90 minutes to the northern part of the Mud Hole and the wreck called the *Junior*. George Hoffman, the captain of the *Sea Lion*, and a pioneering deep diver himself, knew all too well the problems that we would face once we reached our destination. The normal method of grappling the *Sea Lion* to the wreck would not be used in this case because of the depth and the poor visibility that might be encountered. Instead George would try to locate the bridge of the vessel with the fathometer, an almost impossible task, and drop a heavy shot line on or near it, facilitating the shortest possible descent to the superstructure.

The *Sea Lion* wallowed in a moderate beam sea as she came about and headed slowly for the small, white buoy bobbing up and down in the distance. As we came to a stop alongside the jug, the metallic sound of the foghorn knifed through the stillness aboard the boat, signaling it was time to go. Gary and I hit the water at the same time and began swimming toward the marker buoy. Once there, we paused for a moment to let the remaining air out of our suits and to check that we still had our decompression lines in place on our tanks. With everything seemingly in order, we slipped beneath the surface, dropping feet first along the almost-invisible, black dacron line. The water color became progressively darker as we descended, going from a bright green to emerald and then finally to ebony as we passed through 130 feet. It seemed as if we had been dropping forever with nothing in sight, our only link with the world above being the thin line that slid slowly through our hands. The surrounding water became even darker, enveloping us in its cold, unrelinquishing embrace.

In the shadowy, near-narcotic world of the deep diver, it is easy for the mind to wander; absolute concentration and singleness of purpose are essential if one is to function properly. My eyes strained against the void beneath our bodies, trying to discern the first faint traces of the wreck that soon began to materialize out of the gloom below. The sash-weighted shot line, narrowly missing the starboard deck railing, had plunged over the side into the soft mud of the bottom. Leaving the line, we settled to the canted decking, raising a great cloud of silt.

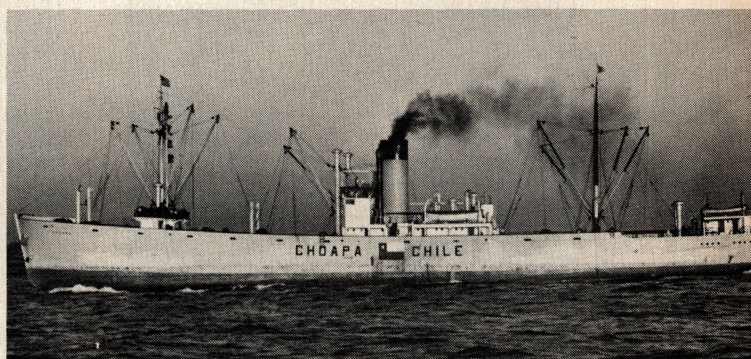
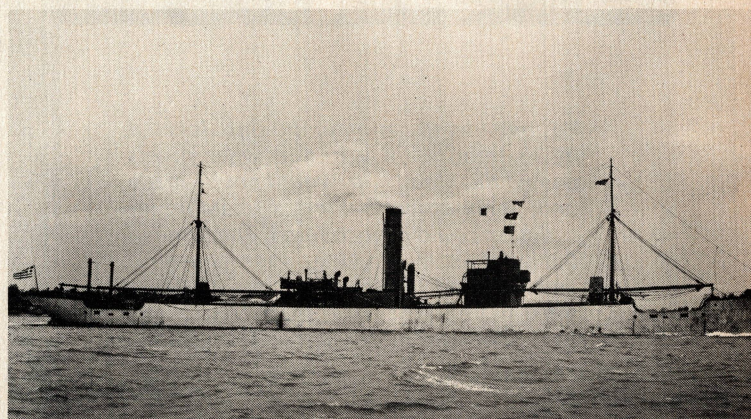
For a short time we waited there, allowing our eyes to adjust to the darkness while we tried to figure out where we were, for

it was obvious that we had not landed on the bridge. A quick glance at my depth gauge showed us to be at 175 feet, abruptly reminding me that we had a minimum of time available to locate the bridge and begin the work of unbolting the helm stand. Having no accurate way of being sure which side of the bridge we were on, but knowing that it would be wise to orient on something, we started to swim along the railing. Transparent, spidery webs of the always-dangerous monofilament hung cathedral-like over the wreck. Carefully we picked and cut our way through the entanglements, hoping that our journey would not bring us to the stern.

After swimming over 100 feet and beginning to feel the first pangs of disappointment that we had gone the wrong way, I noticed that the railing under our hands had begun to curve slightly upward, as if it were coming to an end. As we followed its rise, the bridge loomed up, large and ominous, just in front of us. Ascending slightly, we rounded the top edge of the superstructure to view the dim outline of the object of our search. There in the center of the bridge, standing majestically alone, was the growth-covered main steering helm and stand of this old steamship. As I swam to and gripped the spokes of the helm, I was suddenly overcome with a feeling of sadness. I, a stranger in this alien world, was about to remove an object that had stood alone, as a silent sentinel to the ravages of time and the elements, for longer than I had been alive. If we succeeded, never again would a diver be able to experience the thrill of standing at the controls of this iron lady, lying in state on the ocean floor.

Knowing that this task had to be done if we were to solve the

Official U.S. Coast Guard Photographs Courtesy, The Mariners' Museum Newport News, Virginia



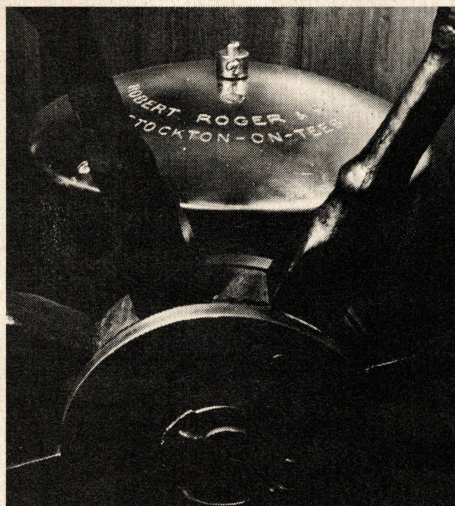
In December of 1942, the I. P. Goulandris, a 3750 ton Greek freighter, sank approximately 11 miles east of Asbury Park, New Jersey. In September of 1944, 21 months later, the 1700 ton Chilean freighter, Choapa, sank in almost the same place.



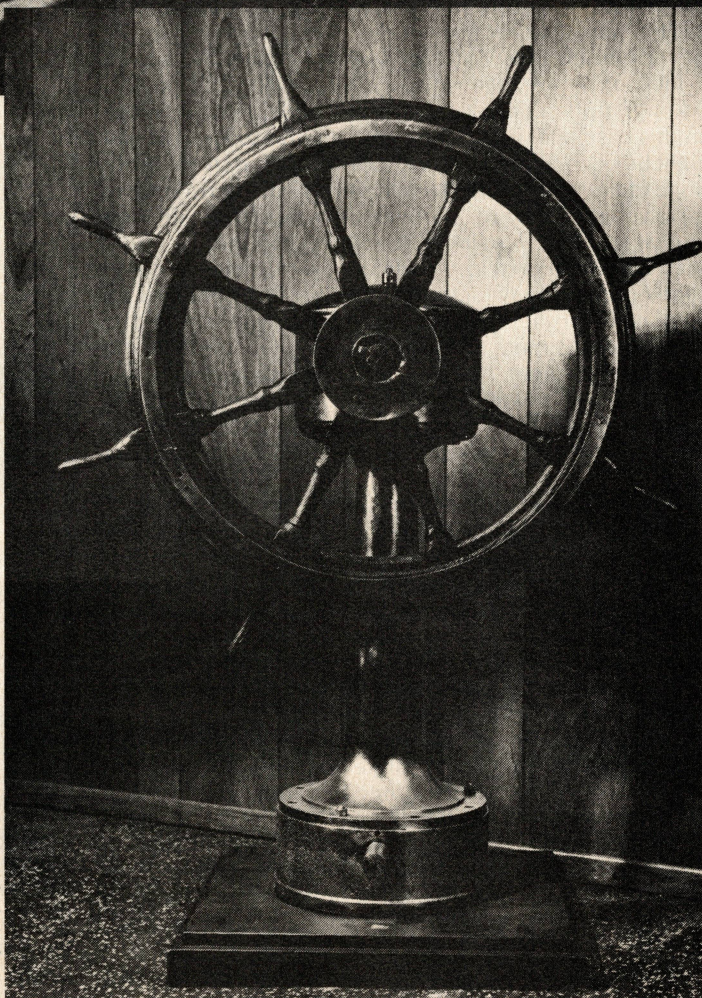


photograph by Don Nilsch

*Positive identification of the ship, located in 33 fathoms of water in what divers named the Mud Hole, would not be made until some object bearing a relatable inscription could be recovered. The stand of the helm, as shown here, was cleaned off and revealed the manufacturer's legend, which verified the ship to be the I. P. Goulandris, formerly the Eggsford.*



photography by James Roach





mystery, I made an effort to concentrate my attention to the job at hand. Gary had already opened his goody bag, taken out his tools, and had begun to clean off the heavy sea growth preliminary to unbolting the large nuts that held the stand to the decking. The layer of brown and white cupcake-shaped anemones must have been two inches thick and resisted our frantic scraping with a tenacity that was surprising and, more importantly, time-consuming as we raced against the clock that irreversibly ticked onward.

It seemed an eternity before we had the brass nuts exposed enough to turn them with our large pipe wrenches. One by one they dropped off, sliding down the sloping deck. Finally, the last nut was off and we stood up and began rocking the stand back and forth with all our strength. The entire unit was loose and could be moved in any direction, but it would not come off. Disappointed and somewhat frustrated, we lay on the deck to more closely examine the loosened stand, trying to discover in the beams of our powerful lights what still held the unit tethered to the deck.

In no time we found the source of our problem: buried under the soft deck growth, and running aft from its union in the stand, was a two-inch solid brass shaft that was the driving mechanism of the helm. Topside we had foolishly speculated that the helm would be chain-operated and consequently easy to dismantle. With the realization that we had guessed wrong and knowing we could accomplish nothing more than prolong our decompression stop, we tied our line directly on the wheel and started toward the surface. After a long, uncomfortable hang, we surfaced and swam back to the *Sea Lion*, lying at anchor a short distance away. As we boarded the craft, we handed our decompression line, still tied to the helm, to one of the mates who fixed it securely to a samson post in the bow of the boat. After shedding our dripping gear, we went below for the inevitable post-dive debriefing.

In the welcomingly-warm surroundings of the cabin, the atmosphere was electric. Other returning teams of divers who had gone below specifically to check certain parts of the wreck had been successful. The photographs were brought forth, checked, and rechecked against what the divers had just seen. Two divers, Don Nitsch and Jan Nagrowski, had made the tedious swim to the stern of the wreck to check details that would clear up the dilemma as to which vessel rested beneath us, the *Choapa* or the *Goulandris*. At the stern they had found a huge, double auxiliary helm mounted on a low poop deck and a definite counter stern. There could no longer be any doubt: the *Junior* had to be the *Goulandris*. Although overjoyed that we had accomplished our mission, I could

(Continued on Page 78)

# THE RED SEA



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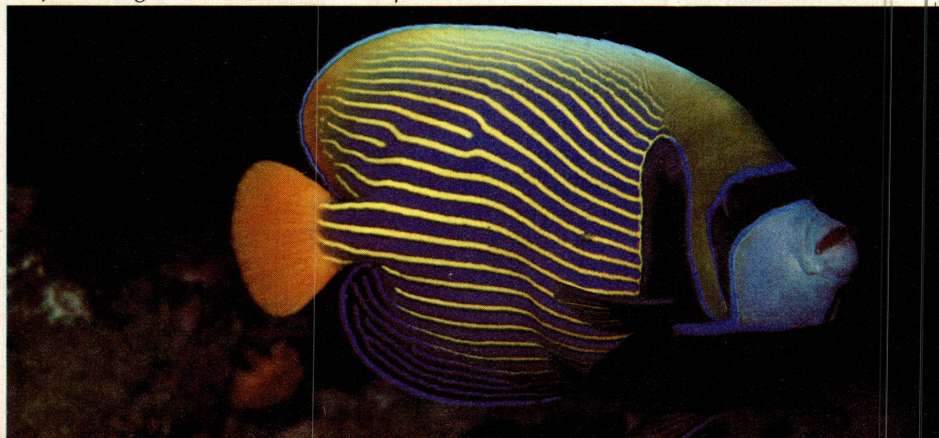
Queen angelfish/*Holacanthus ciliaris*

Royal empress angelfish/*Pygoplites diacanthus*

As a group, the angelfish family, Chaetodontidae, are probably the most colorful of the marine fishes. Most of the fish in this family are colored quite differently in their juvenile stage from adults. The chaetontids are diurnal and at night enter into a state of torpor. At this time they may also exhibit color changes. They are usually seen in pairs or as solitary individuals. Certain fish are herbivorous and eat sponges, worms and small crustaceans; others are omnivorous. Angelfish are not found in great quantities and since they are curious and comparatively fearless, would be easy targets for thoughtless spearfishermen.



Emperor angelfish/*Pomacanthus imperator*





# Angels<sup>of the</sup> Sea

By Carl Roessler

If there were somehow to be a competition to determine the most colorful and graceful fish family in the sea, the angelfish would be a potent contender. These regal beauties are found in tropical shallows around the world, sweeping slowly above the coral reefs like important visiting personages.

The angelfish are members of the family, Chaetodontidae, with the generally smaller butterflyfishes. Both have thin, tall wafer-shaped bodies and the unusual comb-like teeth which give them their scientific name.

The principal characteristic which unfailingly distinguishes the angelfish (*Holacanthus*, *Pomacanthus* and *Centropyge*) from their smaller cousins is a strong spine rooted forward of their operculum, or gill cover. This conspicuous spine enables a diver to accurately identify even the very small angelfish, such as the cherubfish.

Interestingly, juvenile angelfish possess completely different body colors from the adults. For example, juvenile French angelfish or grey angelfish have brilliant canary yellow vertical stripes on a dark body, and are to be observed as cleaners, picking parasites from the bodies of other fish. Since many other species of cleaner shrimp, wrasse and gobies are also striped, it is quite possible that the striped pattern is in itself an advertisement of available cleaning services. As the juvenile angelfish grow they eventually lose their stripes and cease performing cleaning functions.

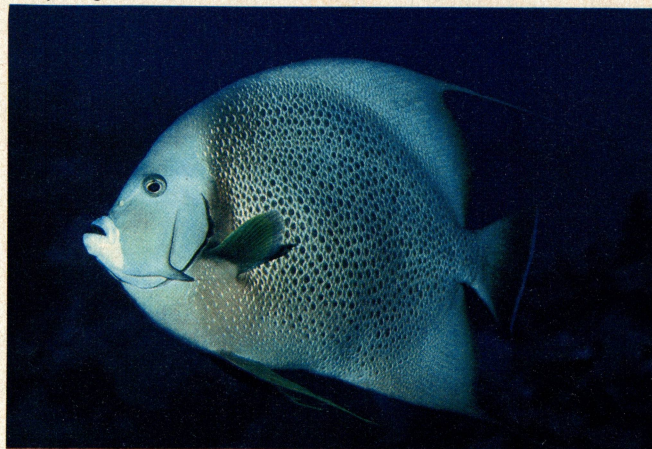
Angelfish diets vary from species to species. Obviously, those who act as cleaners during their youth eat the tiny isopods and copepods (crustaceans) which parasitically plague many fish. Other species can be observed nibbling sponges, browsing on coral polyps, or eating algae. I have also hand fed them with bits of ham or cheese, bread and tiny chunks of fish. Grey angelfish have on numerous occasions circled above me biting my exhalation bubbles. During these enchanting moments it was impossible to decide whether the angelfish was merely playing (a tempting thought, and the one I personally favor) or trying to eat them.

The angelfish generally seem not to be preyed upon by larger fish. Swimming freely above the reef despite cruising barracuda and sharks, these brightly colored fish maintain their serenity even when approached by noisy divers.

Angelfish are occasionally speared by thoughtless divers — an especially deplorable act because these defenseless creatures are not a particularly good food fish. In some islands angelfish are caught in fish traps and used as an ingredient for fish soup with many other species, another unfortunate pressure on their numbers.

The principal value of the angelfish to man should be as a functioning member of a healthy reef community, and as a photographic or fishwatching subject. Certainly a family of fish whose strong suit is beauty should be valued principally for that beauty. For those of us whose lives are spent in underwater photography, these magnificent fish offer some of our most rewarding moments in the sea. Future generations of divers should have the same opportunity to coexist in harmony with these majestic queens of the reef. »

Gray angelfish/*Pomacanthus arcuatus*



French angelfish/*Pomacanthus paru* (juvenile)



Rock beauty/*Holacanthus tricolor*



photography by Author



# News Briefs

By Hillary Hauser



## MYSTERY STONES

In July we told you about an underwater find off Mendocino, Calif., which resulted in the discovery of three old Asian stone anchors. The divers who made the original find, Wayne Baldwin and Bob Meistrell of Dive-N-Surf, Redondo Beach, Calif., have since returned to the site and have recovered additional hand-shaped stones that are not indigenous to the area. Their origin is not yet known, but the discoveries have created world-wide interest. Archaeologists are now studying the finds in hopes of coming up with clues.

## OCEAN CENTER

The U.S. Navy is planning what it calls an "oceanographic center of excellence" at Bay St. Louis, Missouri. The center would include all of the present Naval Oceanographic office and the Office of Naval Research, as well as other departments managing ocean science programs. According to *Ocean Science News*, the idea behind the move is to centralize oceanographic activity. Site of the new Navy ocean science center would be the Nat'l. Space Technology Lab on the Pearl River (the boundary between Mississippi and Louisiana). Other sites previously considered were: the Philadelphia Navy Yard; the Davisville, Rhode Island Seabee base; Seattle, Washington; and Newport, Rhode Island.

## HANDS OFF!

By the end of this year we should know something about the status of the marine sanctuary nomination for the reef area adjacent to John Pennekamp Coral Reef State Park. The area, roughly 100 square miles in size

(five miles wide by 21 miles long) overlaps the Key Largo Coral Reef Preserve and is one of the largest living coral reefs in continental U.S. coastal waters. Under the terms of the nomination, removal or destruction of natural resources and marine life other than fish would be prohibited, as would dredging, filling or polluting. Permits would be issued for educational efforts, scientific and industrial research, and other non-use activities. An environmental impact statement was to be prepared early last summer and a sanctuary designation possible by the end of 1975.

Meanwhile, the final regulations of the *Monitor* Marine Sanctuary took effect with the publication of the May 19 *Federal Register*. The Civil War ironclad is protected over an area one mile in diameter, extending in a vertical water column from the ocean surface to the seabed, off Cape Hatteras, N.C.

## CHAMBER COMPLEX

A \$13.5 million, five-chamber hyperbaric complex is being constructed at the Naval Medical Research Institute in Bethesda, Md. The Environmental Health Effects Laboratory (EHEL) will house the new chambers and in addition will have 57 small animal chamber units, each consisting of two interconnected pressure chambers. The institute will use these to work with mice, rats, dogs and cats in various diving studies, one of which includes the examination of the spinal column to see what happens to the central nervous system in decompression sickness. In the larger chambers men and monkeys will be studied. Each chamber is designed for a specific purpose and in-

clude: an outer pressure lock; a dry environment research chamber; a diving chamber that can set water temperatures anywhere between 28° and 85°F.; an interim chamber that serves as an inside lock and access to the animal chamber; and the animal chamber. The building of the chambers is expected to be completed in 1977; the construction of the EHLE began in December of 1974.

## "BUNCH OF ROT!"

"The oceans are enormous. More than 70% of the earth's surface is water. There's no way we can pollute our seas to the level of extinction." Thus speaks Willard Bascom, director of the So. Calif. Coastal Water Research Project, author of the books *Waves and Beaches* and *A Hole in the Bottom of the Sea*, former head of the Mohole Drilling Project, and former researcher at Scripps. In response to Jacques Cousteau's statements that the seas are becoming a "vast cesspool," Bascom says, "It's all a bunch of rot!" Cousteau's statement that the seas will begin to die in 20 years, says Bascom, is the statement of an alarmist rather than a scientist. "Obviously it is possible for man to pollute a small area of the ocean for a short time. But a year later it will be thoroughly clean as the result of natural processes — diffusion of the pollutants in the water, tidal wash, current action and so on," says Bascom. Bascom, who was quoted in the *National Enquirer*, says that he does not favor indiscriminate dumping of dangerous pollutants into coastal waters, but that over the long run the oceans could even handle that.

## HELP AT HAND

If all went as scheduled, the *Perry Recon II* has been undergoing tests for the past few months. The vehicle is designed for submersible rescue. It is Perry's answer to the National Transportation Safety Board's final *Sea-Link* report which indicated a need for a device capable of rescuing civilian submersibles. The *Recon II* is a tethered vehicle which operates from the surface; it can sever wire rope, is outfitted with a video system, depth capability is 1500 feet, speed is three knots.

Other companies are coming up with their own devices. Benthos, Inc. (Maine) has developed the Emergency Acoustic Beacon, to locate sunken marine craft at any depth in any ocean, and Link Port (Florida) now has the *Sea Guardian*, a 23 ft. surface utility rescue craft. *Sea Guardian* will be used by Harbor Branch ocean research vessels, and also supports *Cord*, a tethered deep-sea diving U/W television rescue device developed at Harbor Branch.

## NEW RESOURCE?

California Fish and Game officials have announced that millions of tons of squid and anchovies that swim around off the California coast are "the largest underutilized food source" in California waters. Scientists figure the anchovy resources could support an annual catch of 200,000 tons without diminishing the resource. Squid are abundant, too, and scientists are now beginning a quantitative analysis of that resource. If all goes well, the two seafoods may be used in more dishes than pizzas and calamari.



## GET IN LINE, YOU, I WAS FIRST

It's the modern day Fountain of Youth. It smooths wrinkles, fades liver spots, improves memory, returns hair to its original color and fullness, prevents senility, enlarges breasts, and cures impotence caused by vascular problems.

The miracle cure-all is 100% pure oxygen, and elderly patients around the country are supposedly lining up at various hyperbaric facilities to await their turn in the chambers. The treatment is called hyperbaric oxygenation therapy (HBO).

We have received several news reports of HBO and its effects on elderly persons. As indicated in a *Medical News* report sent to us by Dr. Murray Grossan, the evaluations of the results of hyperbaric oxygen treatments still contain a "certain degree of subjectivity," but the fact remains that a significant number of persons are achieving favorable results from the oxygen.

The first time the HBO therapy came to light was in 1969, when a Buffalo, N.Y., group reported that hyperbaric oxygen seemed to reverse cognitive and memory losses in the aged. Various medical experiments were conducted here and there, and generally the effects of the treatment seemed to last from two to four months, with patients returning for "booster series." Another news report about HBO in *Women's Wear Daily* was sent to us by reader Diana Lechiaro. The report quotes Capt. George B. Hart, director of research at the U.S. Naval Hospital in Long Beach, Calif., who says, "I am now convinced oxygen itself is a drug which can be used as an addition to other treatments." Hart cautions against sensationalism: "It

must be emphasized these results are anecdotal, not scientific. An old man who hadn't been doing it for years says he's potent again. A bald-headed marine wants more treatments because he's noticed new hair growth. The effects can be medically explained but they're still anecdotes, not scientific tests."

Hart doesn't think "more reliable" tests are likely in the near future, since hyperbaric chambers are needed more importantly for aid in curing diving disease, CO poisoning, burns, gas, gangrene, etc. But he has an eye on the future: "A company could have a large chamber and hold its morning meetings in there. Or you could take treatments during lunch . . . The few studies we have done show that with HBO there is improvement in vascular senility when the brain cells are not dead. That's why I mention a preventative program starting at 35." Hart himself put a young Marine with spinal osteomyelitis into a chamber and the patient was cured. Soon after that, six more osteomyelitis cases were cured and today the naval hospital dispenses 5000 treatments a year.

At present you can't get HBO treatments because of their side effects. Before people can be treated for weight problems, skin smoothing and sex drives, it is more likely that senility prevention and maintenance of mental lucidity will come first on the list of priorities. To make HBO available to the general public, Hart cites a need for private funding. In that case HBO would cost about \$10-\$20 per treatment, or \$400 to restore the brain.

That's cheaper than a college education.

## WHALE BONERS

When President Ford's 80-member party of U.S. officials and newsmen arrived in Vladivostok, Russia, last year they were presented with gifts—souvenir plaques made of whale bone. The presents are now being confiscated. Because whales are an endangered species it is illegal to bring whale bone products into the U.S., but apparently a number of officials and newsmen were unaware of the ban. Groups dedicated to the protection of whales pressed Customs Service to enforce the law. Customs officials were worried that confiscation of the Soviet gifts would damage detente between the two governments, but were reassured by the White House that it wouldn't. The officials were asked to turn their plaques in. At the time all of this was going on, President Ford delivered a foreign policy speech to Congress in which he spoke of U.S.—Soviet relations.

Aides said one of Ford's sentences had "nothing to do with the whale bone gifts," but we found it interesting anyway. Said Ford, "As long as I am President, we will not permit detente to become license to fish in troubled waters."

## U/W STORAGE

Man can increase his food supply simply by storing grains and fish at the bottom of oceans and lakes. That's what one scientist announced last winter during a meeting of the American Association for the Advancement of Science. About 50% of harvested grain is lost to rodents and birds because of conventional storing methods. With the underwater concept, wheat would be packaged in flexible film containers surrounded by protective netting. Conditions on the ocean bottom would substantially increase storage life, says the scientist, and are better than methods now used. Japan

has already tried such storage methods for grain with success, and other tests have indicated that high pressure and low temperature will increase about three-fold the storage life of whole fresh fish over the usual atmospheric pressure storage.

## EATING THE SEA

Just out: *The Edible Sea*, by Paul and Mavis Hill, two California diving enthusiasts who have experimented with the cooking of every type of sea thing imaginable, from sea cucumber to sand dollars. Featured in the book: what is edible, what is toxic, how to identify it and where it's found, and how to prepare it for the table, step by step. 320 pages, illustrated. Available from A. S. Barnes and Co. for \$15.00.

## ODDS & ENDS

Capt. Jacques Cousteau has told the Assembly Natural Resources Committee in Sacramento that spearfishermen should be banned

from California because their presence "terrorizes the fish populations . . ." President and President-elect of the U/Sea Medical Society for 1975-76 are Dr. Peter B. Bennett, director of diving research at Duke U., and Dr. Art Bachrach, Naval Medical Research Institute . . . UC Davis scientists are experimenting with salt-water irrigation; barley is being planted in sand dunes and irrigated with water from Bodega Bay . . . The OSA-3-600, a new Russian "underwater helicopter," was put to sea for tests last April. The egg-shaped craft can hover underwater, do complicated aerobatics with precision, submerge to "great depths," carry three men.

. . . Ooops! We goofed. A *Guide to Polar Living* by Wallace T. Jenkins described in August News Briefs is not available at the Government Printing Office. Instead, write Mr. Jenkins at the Naval Coastal Systems Laboratory, Mail Code 710.1, Panama City, Florida.



# key largo

home of Pennekamp Park

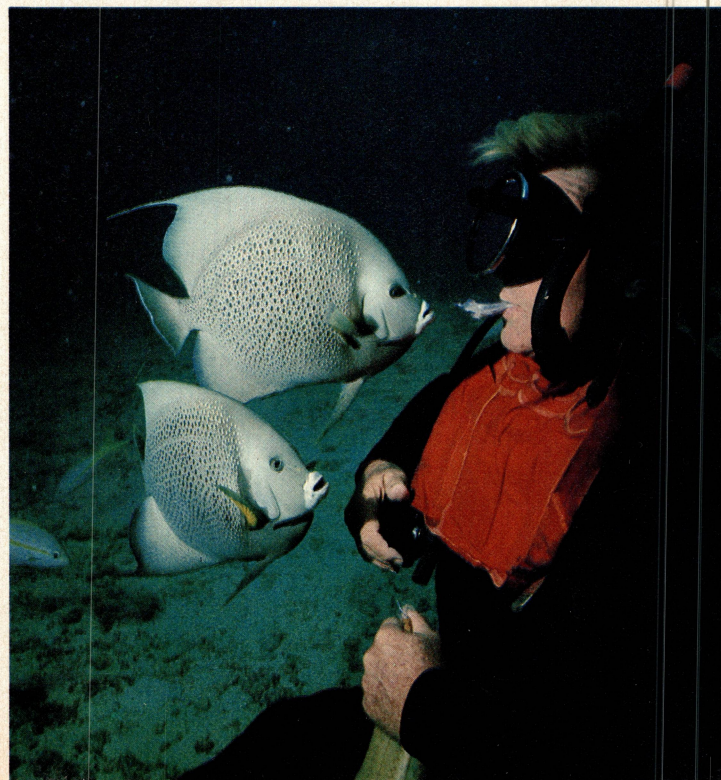
By Paul J. Tzimoulis

**F**irst in the hundred mile chain of sparkling Florida Keys, Key Largo is one of the biggest and busiest diving areas in America, if not the entire world. Key Largo is actually an island measuring some 26 miles in length and averaging less than a mile in width. Her front borders the blue Atlantic, constantly being bathed in the warm, clear waters of the gently flowing Gulf Stream. On the opposite side a labyrinth of shallow sand flats, mangrove islands and winding creeks lead into "the back country" and eventually the Everglades.

The main artery of this slender island is U.S. Highway 1. Crammed together along this roadway are no less than ten dive shops, three independent underwater guides, and a total of 22 commercially operated dive boats. In between are nestled a continuous line of roadside motels, restaurants, souvenir shops and mini supermarkets. And if you count them, there are 35 divers flags and signs posted along the highway, alerting passing divers to everything from dive trips to special motel rates.

Diving is a way of life in Key Largo and perhaps the single most important attraction for the economy of this bustling community. Each year more than a quarter of a million divers pass through Key Largo, contributing tourist dollars to a variety of resort related businesses. On holiday weekends the number of visiting divers is often likely to outnumber the local residents by three to one. And for this reason Key Largo puts out the welcome mat for divers like no other island in the Caribbean.

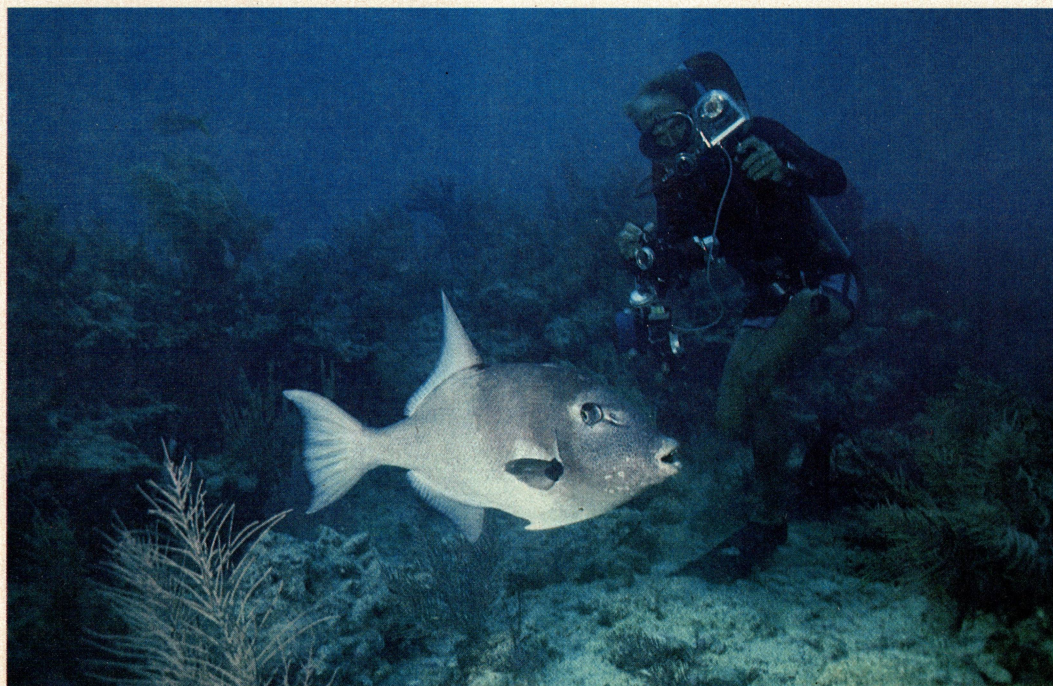
*Professional underwater guide Steve Klem patiently coaxes a pair of gray angelfish to take a piece of ballyhoo from his lips. Klem has trained fish in Pennekamp to take food from his hand or mouth.*







*Underwater photography enthusiast Dave Lindsay prepares to shoot a picture of a school of grunts cruising serenely through the elkhorn coral at Molasses Reef, one of the favorite photographic sites in Pennekamp Park located off Key Largo, Florida.*



photography by Author

*Underwater photographer Jim Doran lines up for a flash shot of an exceptionally friendly ocean triggerfish at the Elbow Reef. Usually, these fish are exceedingly wary and are seen traveling in loose groups of about six individuals.*





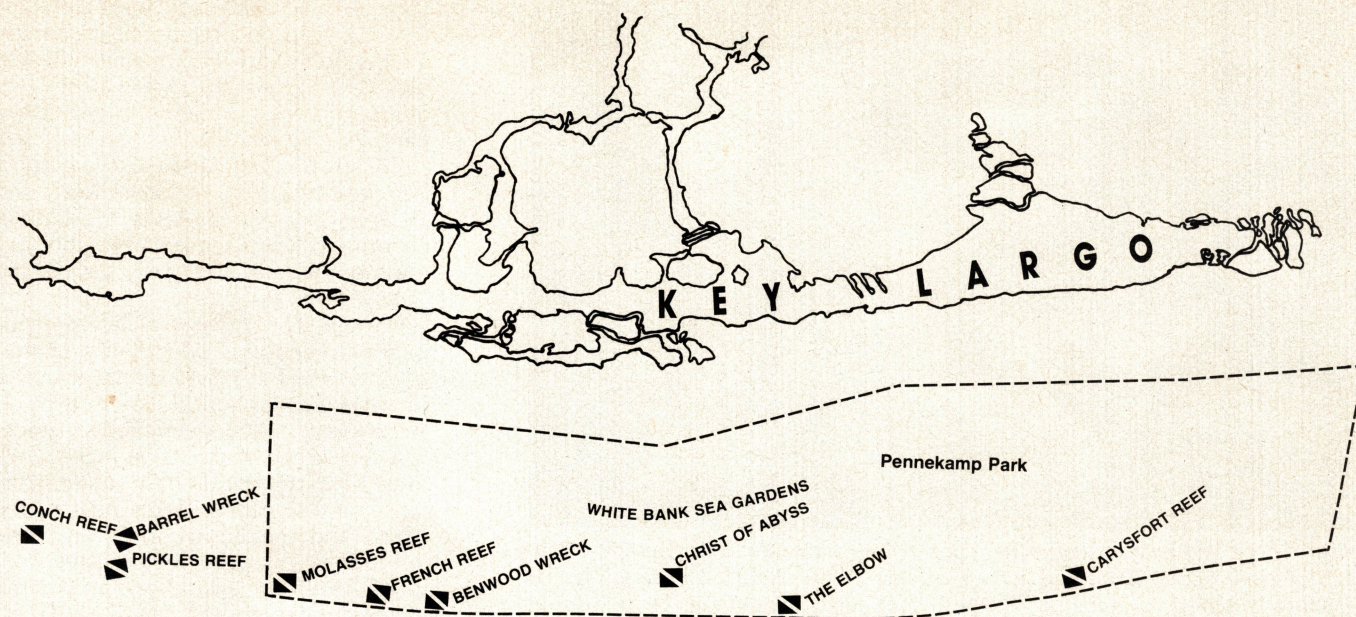
*Captain Steve Klem of Underwater Guild Services feeds a pair of gray angelfish at The Elbow Reef. Author of the book, *Training the Untamed*, Klem specializes in hand feeding the residents of Pennekamp's prolific reefs.*

*Skipper Bill Crawford of the Photo Too prepares to shoot an U/W photo of a school of fish around a large brain coral at Molasses Reef. Crawford operates daily trips to the reef from the Tiki Isle Dive Shop.*



*One of the great mysteries of The Elbow is an ancient cannon sunk in 30 feet of water off Elbow Light. The cannon is too old and heavily encrusted to determine its country of origin. No one knows how it got there, or if rest of wreck is nearby.*





What makes Largo so popular among divers? The reasons are as varied as the services offered, but there are several basic reasons which quickly become obvious. First, Key Largo is conveniently accessible by car, bus, boat, or plane. It is not unusual to see automobiles bearing license plates from most states, as well as Canada and Alaska. Divers from inland states often pool together their vacation resources and drive down to Key Largo in a community vehicle for what is often their first warm water ocean dive. Scuba instructors from upstate Florida, Georgia and other states regularly bring their entire scuba classes to Largo for open water training dives and the student's final check out dive.

Another key factor in Largo's popularity is its close proximity to Miami. Located at the very "top" of the Keys, Largo is only a 50 minute drive from Miami International Airport. Traveling divers, returning from Caribbean island trips, often stop in Miami for a couple of extra diving days in the Florida Keys to round out their vacation.

But by far the greatest attraction of Key Largo is the fact that it is the home of the John Pennekamp Coral Reef State Park, one of the nation's first undersea parks designed for recreational use. Measuring some 21 miles in length and averaging four miles in width, this sprawling undersea park covers almost 73,000 acres of living coral reef. It is the largest and best used park of its kind, hosting an estimated 350,000 visitors annually.

Marine life within the Park is protected from spearfishing and coral collecting,

and Pennekamp has evolved into one of the great fish bowls of the world. The concentration of fish, both in numbers and variety, cannot be equaled. Diving Pennekamp Park is like plunging into a giant salt water aquarium, with depths ranging from 5 to 35 feet. Great schools of porkfish, grunts, and snapper cruise serenely past, unconcerned with the divers presence and knowing full well that they are protected by state law. Angelfish pose for pictures without hesitation and most all species can be fed by hand. The fish have become accustomed to offerings from the divers. There is no question that Pennekamp Park, acre for acre, is the fishiest spot in the Caribbean.

Because Pennekamp's reefs are located several miles offshore, dive boats play a vital role in transporting visitors to the reef sites. Each dive shop on Largo operates one or more dive boats, and some as many as three. During the slower weekday periods most of the shops schedule one trip daily, but on weekends and during busy vacation periods many of the boats are scheduled for two trips daily. It is not difficult for the hard core dive enthusiast to get in four tank dives a day if he so desires. Since the depths within the park boundaries rarely exceed 30 feet, decompression is not a problem. For the underwater photographer, this type of environment is ideal. He can shoot pictures to his heart's content on shallow reefs where the sunlight is strongest and the colors richest.

Dive boats operating out of Key Largo can be divided into two general categories. The smaller boats are

licensed to carry up to six passengers maximum, plus a skipper and mate. These are usually the faster boats, being lightweight and powered by high speed engines. In addition to getting out to the reefs quicker, the smaller boats can often provide more personalized service since there are fewer passengers involved. The serenely past, unconcerned with the divers presence and knowing full well that though they are a bit slower, the bigger boats provide a much smoother ride, especially in choppy seas. The larger boats are also ideal for accommodating dive clubs, scuba classes, and other dive groups. They offer more deck space for carrying huge amounts of dive gear, tanks, and camera equipment. Both the smaller and the larger crafts serve unique and separate roles in the Key Largo diving scene.

Pennekamp Park covers such a large area of ocean real estate that it is virtually impossible to visit all of the dive spots from one vantage point. This is another reason why there are so many diving operations on Key Largo, and why they are stretched out along a 20 mile section of US Highway #1. It is not impossible for a boat to travel the entire length of the park on special charter, but it is uneconomical on a daily operation basis. Fuel costs are high, and running times can become excessively long.

From a geographical point of view, the park can be divided into three parts: north end, mid-park and south end. Certain shops and guides serve each of these three areas, as well as a few reefs outside the park boundaries. Although there is





*A group of divers from the American Diving II charter boat eagerly begin exploration of an unnamed wreck at the Elbow Reef. The wreckage is suspected to be a refueling barge which was torpedoed by a U-boat during World War II. American Diving Headquarters runs frequent trips to this location because of the excellent visibility and many wrecks.*



*Clearwater, Fla. shop owner Pop Poppalardo prepares to photograph a shy angelfish at the Elbow. Poppalardo frequently brings his scuba classes to Key Largo for their open water training, utilizing the American Diving I as a scuba school.*

*The Unwinder Motel near Jewfish Creek is Key Largo's only high-rise motel, complete with a marina, pool, barbecue and outdoor cocktail lounge.*



some overlapping, practically every Largo dive boat has its own special spots which it visits on a regular basis. For example, Bob Klein, who operates the Village Dive Shop at the Ocean Reef Club, offers daily trips to the north end of the park. Among his list of "regulars" are such spots as Carysfort Reef, *HMS Winchester* wreck, Watson's Reef, and the Spanish galleon *El Aviso*. In addition, he runs to several excellent spots just north of the park boundary, such as the Yellow Brick Road reef.

Harry Keitz of American Diving Headquarters keeps his two diving charter boats berthed at J & J Marina, which is located approximately at mid-park. Steve Klem, an independent dive guide, is also berthed at the same marina. All three boats are within easy running distance of The Elbow, the Christ of the Abyss and the Benwood Wreck. The three boats also run to Molasses Reef when visibility conditions make the longer run desirable.

The greatest concentration of dive boats is situated close to the south end of the park. They operate from such dive shops as Key Largo Diving Headquarters, Bill Crawford's Tiki Isle Dive Shop, Largo Kamp Diving Center, Carl Gage's Diving Center, American Outdoors Dive Shop, and the new Diver's Den. Last but not least is the Coral Reef Company, which is located right inside the Pennekamp Park campgrounds and marina facility. All seven of these shops operate daily trips to a wide variety of reef locations within the southern half of the park. Favorite spots include the world famous Molasses Reef, French Reef, White Bank Sea Gardens and North Dry Rocks. Many of these boats will even travel as far north as The Elbow when the southern dive sites are overcrowded or they are in quest of better visibility conditions.

At the southern end of Key Largo there is still another dive shop known as the Dolphin Dive School, located right at the Marina of Bryn Mawr Camp Grounds. And still further south, at Tavernier, is an independent underwater guide by the name of Captain Cliff King. Both Dolphin Dive School and Captain King operate dive trips to reef sites outside the park boundaries. Their favorite areas are Conch Reef, The Barrel Wreck, and Pickles Reef. Occasionally Captain Noel Crouch of Dolphin Dive School will make a run up to Molasses Reef on days when the park is not crowded.

If a diver desires to visit all the good reef sites off Key Largo, and sample the wide variety of diving available, he should plan to make at least one boat trip with each of the shops on Largo. This is the only way of obtaining an overall picture of Key Largo's entire spectrum of undersea attractions. ➤





*Diving from Bob Klein's Plus Ultra dive boat, Captain Hugh Brown examines a cannonball from the wreck of the HMS Winchester. He operates out of Village Dive Shop at the Ocean Reef Club and dives the north end of the park.*

*Dave Lindsay, manager of Key Largo Diving Headquarters, prepares to explore and photograph one of the many coral caves which honeycombs the French Reef. It is a favorite dive spot for the Headquarters Photo Diver charter boat.*



## KEY LARGO DIVE SHOPS AND INDEPENDENT GUIDES

American Diving Headquarters, Inc.  
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Key Largo, Fla. 33037  
(305) 451-0037  
Harry Keitz, owner

American Outdoors Dive Shop  
Route 2, P.O. Box 117  
Key Largo, Fla. 33037  
(305) 451-2936  
Ed "Tiny" Wirs, owner  
Nancy Wirs, Shop Mgr.

Carl Gage's Diving Center  
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Key Largo, Fla. 33038  
(305) 852-5764  
Carl Gage, President  
Sam Brugger, Shop Mgr.

Coral Reef Park Company  
J. Pennekamp Coral Reef Park  
U.S. Hwy. 1, P.O. Box 13-M  
Key Largo, Fla. 33037  
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Randy Pegram, Owner  
Jim Lucas, Scuba Shop Mgr.

Crusty Dutchman, Inc.  
P.O. Box 144  
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Capt. Jim Longendyke  
(305) 451-0353

Divers Den  
P.O. Box 1397  
Key Largo, Fla. 33037  
(305) 451-1381  
Capt. Noel Crouch

Dolphin Diving School  
Bryn Mawr Campgrounds  
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Reba Crouch, Shop Mgr.

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Ike Beal, Sales

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Capt. Steve Klem  
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(305) 451-1831

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Coral Reef Marina & Airport  
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Key Largo, Fla. 33037  
(305) 451-3640  
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T. J. Holub, Co-Owner

Bill Crawford's  
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Tiki Isle Marina  
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Key Largo, Fla. 33037  
(305) 451-1063  
Bill Crawford, President  
Charlotte Crawford, V.P.  
Tom Micale, Instructor

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## RED SEA REEFS

A plan to develop support for the preservation of the Sinai reefs of the Red Sea, through a YMCA certified Environmental Diver program, has been announced by the International Divers Association. The program will be conducted in conjunction with a special diving tour of the area, developed with the cooperation of authorities in Israel and offered through YMCA diving instructors.



photography by Rick Frehsee

The area, preserved by the rangers of the Nature Reserves Authority, was recently explored by a team consisting of Bob Smith, chairman of the YMCA National Scuba Committee; Ken Brock, director of the "Y" diving program; Tom Mount, diving officer at the University of Miami and a member of the National Scuba Committee; underwater photographer Rick Frehsee; and Jim Horstman, executive director of the International Divers Association.

Frehsee, who has researched the area heavily, commented that the Sinai reefs "seem to be the most diversified in the world, perhaps the most spectacular anywhere." He noted, as did the others, that it is probably the least visited major coral area. Horstman, who led the group, has made five Sinai expeditions.

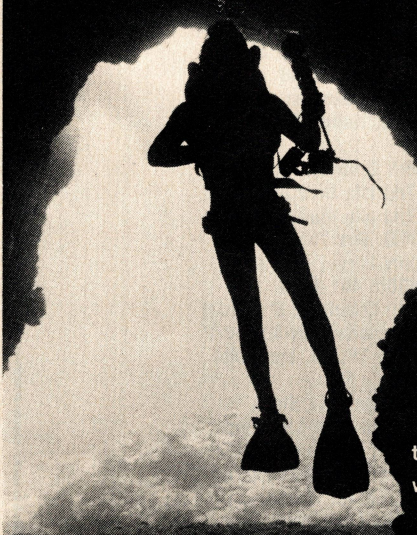
The party pursued the route of the tour groups to follow, diving around the Crusader castle at Coral Island; Ras Burka, the Veiled Head; the blue holes of Nakab Shaheen; the reefs and submarine canyons near the oasis of Dahab; the great Coral Gardens of Shar el Sheikh; and the wall at Ras Muhammed, on the Gulf of Suez.

Like the expedition, tour groups will stay in comfortable, air conditioned hotels, use rental autos and be accompanied by mobile scuba vans of the Andromeda diving center's Sinai Reef Divers. Almost everywhere divers waded or snorkel a short distance from the beach

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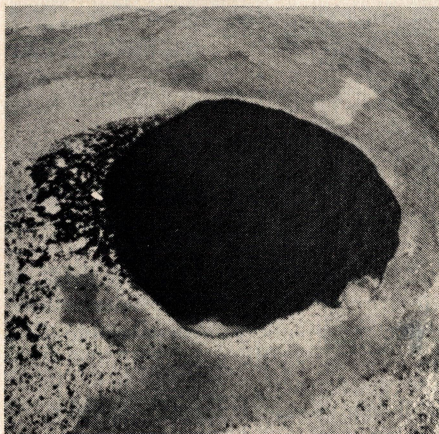
to the reef, which rises almost to the surface and plunges to hundreds of feet.

All tours will be led by YMCA certified instructors and guides, and will include informal lectures by environmental specialists. The ten day, nine night program includes six full days of diving, sightseeing in the Sinai mountains and desert, the Port of Eilat and the old, walled city of Jerusalem.

The cost, including air fare from New York via El Al Israel Airlines, hotels, diving, diving equipment, most meals, rental autos, guides, transfers and service charges is \$995 (non-divers \$845), with a \$100 premium for April and May groups. Departures will be monthly, October, 1975, through May, 1976, with the number of participants strictly limited. Detailed information can be obtained from the International Divers Association, 2 North Riverside Plaza, Chicago, IL 60606. >

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To explore this great Black Hole and other beautiful dive sites contact Capt. Bob Klein at (305) 367-2611, ext. 4312, or (305) 852-5136, or write to: Capt. Bob Klein, R.R. 1, Box 41, Islamorada, Fla. 33036. >

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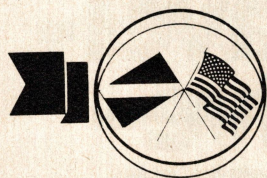
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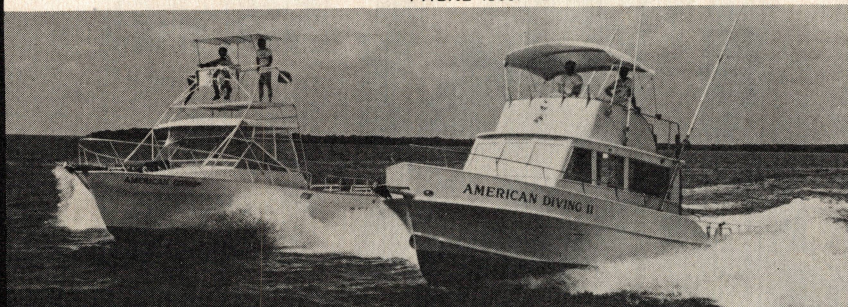
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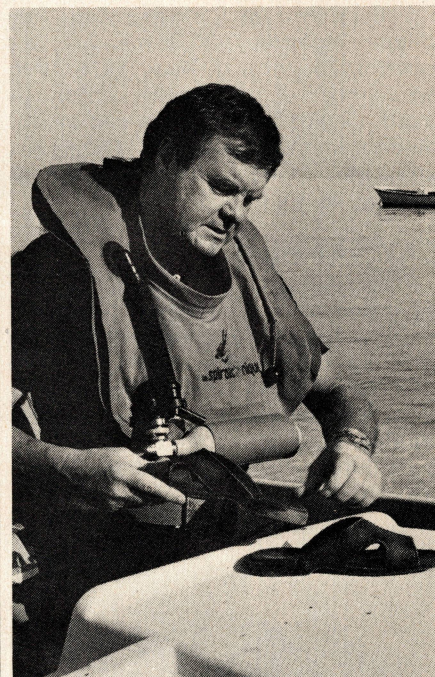
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## PADI JAMAICA INSTRUCTOR COURSE

Ray Morrow, President of Teach/Tour Diving Company, recently announced plans for the first PADI instructor training course to be held in Jamaica. Scheduled to begin on Friday, December 5th, the course will run for a total of eight days and seven nights, finishing with graduation on December 12th. It is open to instructor candidates in both the U.S. and Caribbean nations.



Ray V. Morrow, director for the Jamaica PADI instructor course Dec. 5-12.

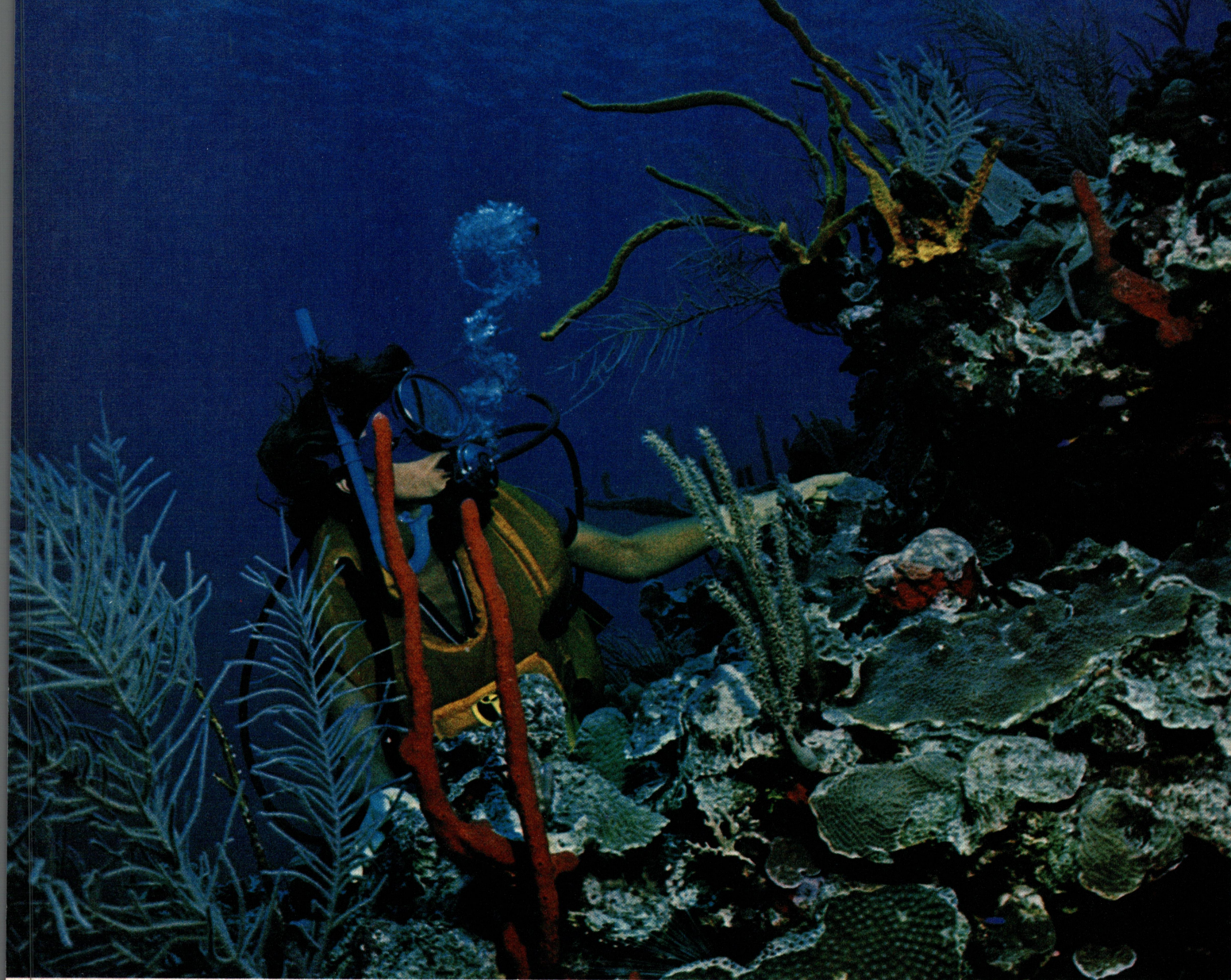
The Chalet Caribe Hotel, located just outside of Montego Bay, has been selected as official PADI headquarters for the course. This is where most of the classroom lectures and diving exercises will be conducted. Open water dives on the coral reefs and drop-offs will be conducted daily as part of the curriculum.

Ray Morrow will be serving as course director, assisted by a staff of four additional PADI instructors who have participated in previous PADI instructor courses. Assisting Morrow with the course program is well known Jamaica undersea guide, David Heath, a veteran instructor of many years and holding instructor certification by both PADI and BSAC. Scuba facilities and diving equipment will be furnished by the recently established firm of Teach/Tour Jamaica Diving Company. Morrow has conducted similar instructor courses in Tobago, West Indies and Nazareth, Pennsylvania.

For more information and course reservations, contact: Ray V. Morrow, Teach/Tour Diving Co., 138-C Beil Ave., Nazareth, Pa. 18064; or telephone (215) 759-6882.



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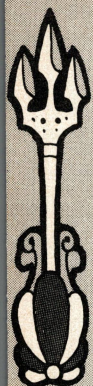
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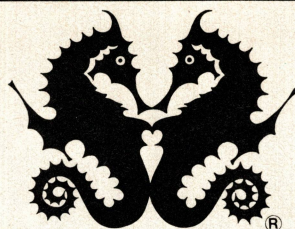
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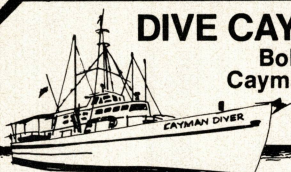
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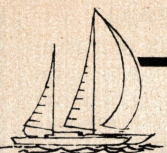
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Further information, write:

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Where to go How to get there What to do



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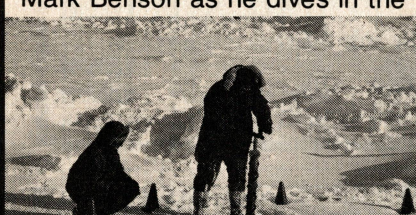


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You get all this: Round-trip flight from New York to Bonaire via KLM and ALM, transfers to hotel, 7 nights/8 days at *Hotel Bonaire* including breakfast and dinner, 6 half days of guided scuba diving including all heavy equipment, plus 1 free rental car per couple for 1 day ... for only \$558.\* Effective Dec. 26 to Apr. 14, 1976.

Send coupon for details. Then see your travel agent or KLM.

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## PHYSICIANS PROGRAM

The islands of Bonaire and Curacao in the Dutch Caribbean will be the location for the second Diving Medical Seminar sponsored by Lee Turcotte's Atlantis Safaris on January 10-18, 1976. The trip will include five days in Bonaire and three days in Curacao.



photograph by Lee Turcotte

The medical symposium will consist of a series of illustrated lecture-seminar sessions. The instructors for the symposium are two men whose names are synonymous with diving medicine: Jefferson C. Davis, M.D., Chief, Hyperbaric Medicine, USAF School of Aerospace Medicine and Vice President of the Undersea Medical Society; and Lt. Col. Bruce E. Bassett, Aerospace Physiologist and specialist in Diving Physiology and Hyperbaric Medicine. The academic program presented by Davis and Bassett is approved by the American Medical Association through the Undersea Medical Society for continuing Medical Education Credits.

In addition to the medical seminar, a complete diving program on both islands has been arranged by Atlantis Safaris and divers will be escorted by Lee Turcotte and Captain Don of Bonaire. A diving course will be available for physicians and their wives who wish to become certified scuba divers while in Bonaire. The medical seminar is also available to professional scuba instructors.

There will be ample time for beach-combing, sightseeing, shopping and enjoying the beauty of both islands as well as the night life and casinos. For reservations and a brochure on the Bonaire-Curacao program in January, please write Atlantis Safaris, P.O. Box 530303, Miami Shores, Florida 33153.

## THE SCUBA SHOPPE

The Scuba Shoppe is a fully equipped underwater tour and instruction organization. They offer a full line of NAUI and PADI courses as well as sales and repair of most major brands of equipment.

They have developed a variety of scuba tours and can furnish ground transportation, all necessary equipment and instruction, if needed. Diving around the island of Oahu, from a boat or the beach starts at \$25 for one dive with everything supplied. Groups of up to 12 people can be accommodated.

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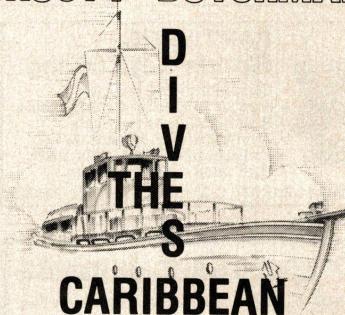
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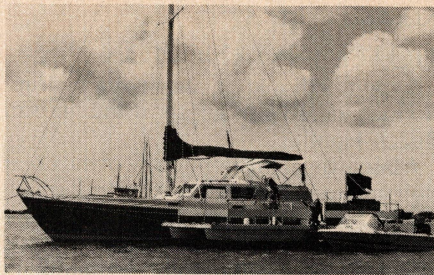
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45-foot Motorsailer. Their sail/dive excursions to Molokai, Lanai, and other sites cost \$50 per person per day. The cost is \$40 per person per day for non-divers. Half-day trips are available.

The Scuba Shoppe's Basic Scuba Course is a one and a half week program especially suited for the tourist on a two week vacation who wants to learn to dive. The cost is \$90, or with hotel accommodations the cost is \$40 per person per day and includes hotel, all ground transportation, and an intensive 40 hour course with all equipment supplied.

For more information concerning their line of special activities, write: The Scuba Shoppe, P.O. Box 27105, Honolulu, Hawaii 96827.

## HAWKS NEST



Hawks Nest is a five-story, 28 unit interval ownership of vacation homes nestled at the foot of Seven-Mile Bridge in Marathon, Florida. Each vacation home has a wide balcony with a sweeping view of either the Gulf of Mexico or the Atlantic Ocean, and each is furnished from color television to coffee pot.

When you vacation at Hawks Nest, you can automatically qualify for the "love it or leave it" plan. This simply means that the \$400 rate spent for a week's vacation for six can be applied toward the purchase price of a one or two bedroom unit.

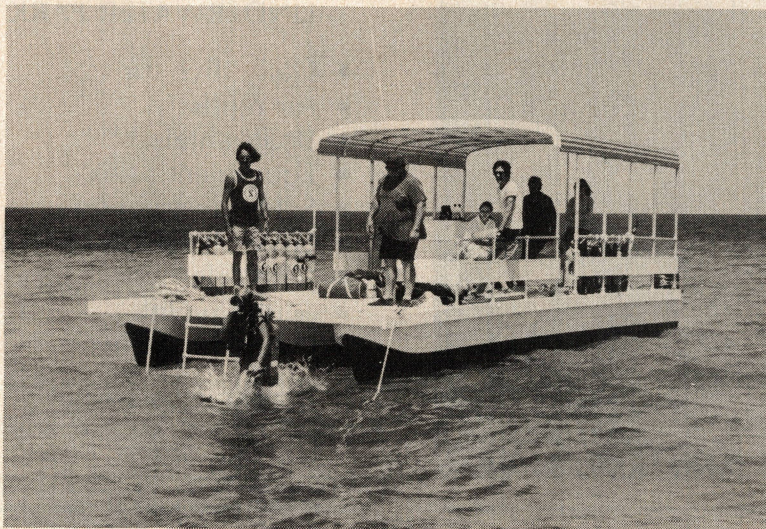
The \$400 rate includes your room; six reef trips per unit for certified divers on a 28-foot Sport Diver *Enterprise* of a week of instruction for certification at Hall's, a PADI training facility; free air; free use of Hawks Nest 17-foot outboards or the catamaran sailboats; swimming pool; outdoor gas barbeques; game room.

This vacation is for up to six divers and is offered through December 15. It entails no other commitments whatsoever. Direct air service is available via Air Sunshine from Tampa and Miami with car rentals available at the Marathon Airport.

For more information about these packages and the vacation homes, contact: Hawks Nest, Number One Kyle Way South, Marathon, FL 33050.

## IF YOU ENJOY DIVING, YOU'LL LOVE THIS ISLAND!

... where Columbus first set foot in the New World



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HUD neither approves the merits of the offering nor the value, if any, of the property.

A statement and offering statement has been filed with the Department of State of the State of New York. The filing does not constitute approval of the sale or lease or offer for sale or lease by the Department of State or any officer thereof or that the Department of State has in any way passed upon the merits of such offering. A copy of the offering statement is available, upon request, from the subdivider. And in addition thereto the assigned advertising number. NYA-74-1153





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Per Person Minimum Four.

Departures from:

MIAMI-NEW ORLEANS:

| Hotel/Lodge    | Dec. 1<br>to Apr. 15 | Apr. 16<br>to Nov. 30 |
|----------------|----------------------|-----------------------|
| Coral Beach    | \$303.00             | \$289.00              |
| Lomonts Glover | \$313.00             | \$313.00              |
| Dive St George | \$333.00             | \$303.00              |
| Extra Nights   | \$ 45.AP             | \$ 35.AP              |
| Cruiser:       |                      |                       |
| Keller Sports  | \$553.00             | \$453.00              |
| Lodge:         |                      |                       |
| Keller Sports  | \$503.00             | \$453.00              |
| Extra Nights   | \$105.AP             | \$ 85.AP              |

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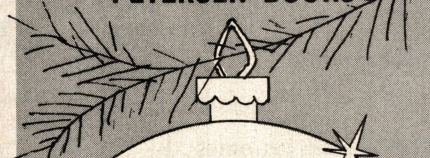
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## NASSAU BEACH HOTEL INSTRUCTION

Expert skin and scuba diving instruction is available to guests at the Nassau Beach Hotel.

"Because of the popularity of the clear Bahamian waters with skin and scuba divers, we have a fully-qualified instructor at the Nassau Beach Hotel. Guests can make appointments for instruction in our pool. Under the auspices of Underwater Tours Ltd., trips for the novice, snorkeler and the enthusiastic watcher, as well as the experienced scuba diver, are available," according to George Myers, vice president and general manager of the Nassau Beach Hotel.

For the novice, a special scuba package is available for \$30, which includes instruction in the Nassau Beach's pool, scuba equipment, and a staff member who accompanies each two novices on a half-day reef trip — plus transportation to the diving vessel.

Underwater Tours utilizes *The Royal James*, a 65-foot diesel-powered diving vessel. Features of the vessel include a special diving platform, fresh water showers and changing rooms. Underwater cameras are available.

For the experienced diver, a host of equipment is available on a rental basis, including 72 cu. ft. cylinders, weight belts, regulators, masks, snorkels and swim fins.

Those seeking longer trips, can charter either a 23-ft. Formula or 25 ft. Magnum. Rates begin at \$80 for one half-day. Special diving boat rentals are available daily or weekly. Also offered are special rates for groups.

For further information about skin and scuba diving trips from the Nassau Beach Hotel, contact any travel agent or the Nassau Beach Hotel, 500 Deer Run, Miami Springs, Fla. 33166.

## RED SEA DIVING

Joe Dorsey, NASDS instructor and owner of Divers Den, Baltimore, Maryland, is offering a dive tour to a limited group for unusual diving experiences in the Red Sea.

The fare of \$749 includes eight nights' full board accommodations, round trip transportation from Baltimore to New York and Tel Aviv; bus transportation from Tel Aviv to Jerusalem, Eilat and back to Tel Aviv; a visit to Jerusalem; swim in the Dead Sea; night tour of Tel Aviv; and diving in the Gulf of Eilat.

Some of the diving spots will be the Coral Beach Area, the Nature Reserve Reef, Moses Rock, Black Coral Forest, and Coral Island. Visibilities are upward of 100 feet year round, and several sources indicate night diving under a full moon can almost be done without artificial light.

Interested parties can contact: Joe Dorsey, Divers Den, 8105 Harford Rd., Baltimore, Maryland 21234; or call (301) 668-6866.



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**Cayman Kai Resort Ltd.**  
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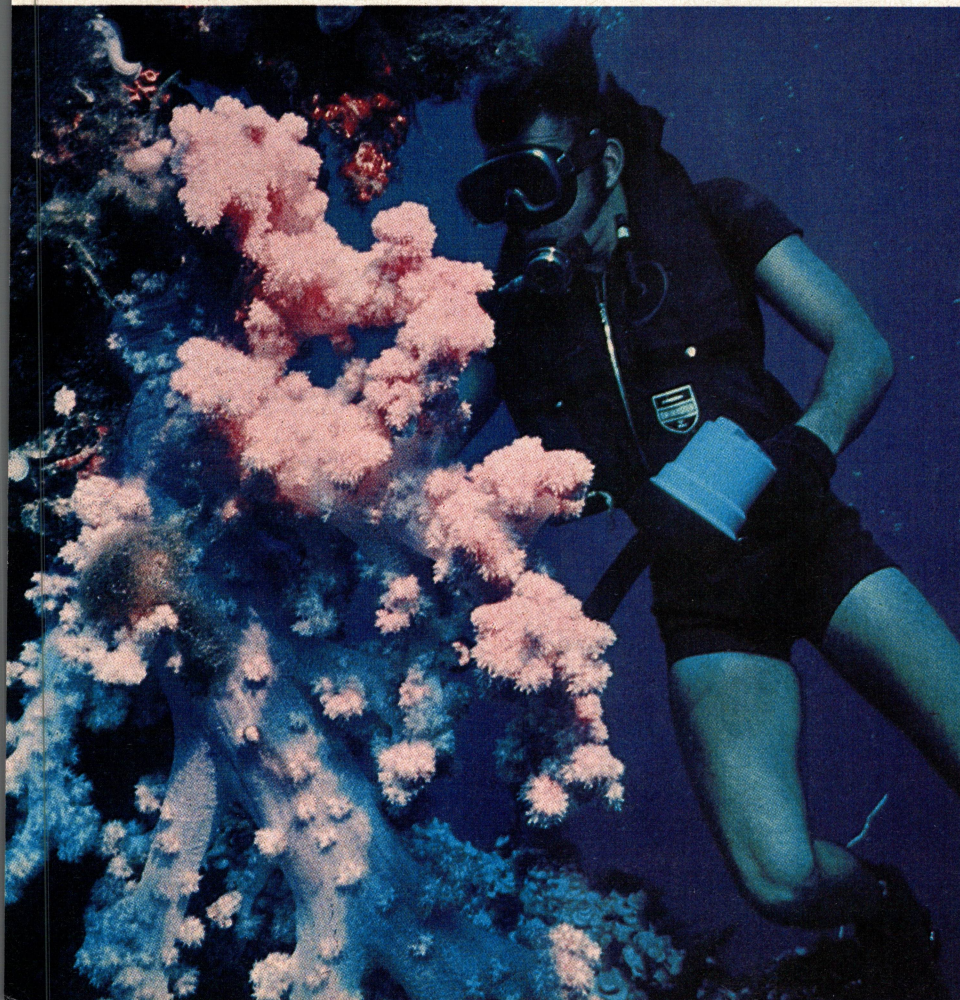
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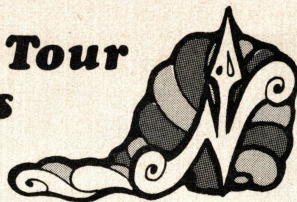
ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_

STATE \_\_\_\_\_ ZIP \_\_\_\_\_



## Dive Tour News



Oct. 2 — BIMINI — 5 days, Capt. Tom Guarino, Islamorada, Fla.  
 Oct. 2 — TRUK, GUAM, PALAU — 16 days, Innerspace Adventures, Pearl City, Hawaii.  
 Oct. 2, 9, 16, 23, 30 — KONA, HAWAII — Fair Wind, See & Sea Travel, San Francisco, Calif.  
 Oct. 3, 10, 17, 24, 31 — BONAIRE — 8 days, Lisind Int'l, New York, N.Y.  
 Oct. 4, 18 — BAHAMAS — 7 days, Tropic Diving Cruises Inc., Ft. Lauderdale, Fla.  
 Oct. 4, 25 — SAN ANDRES — 8 days, Go Mexico, Inc., Minneapolis, Minn.  
 Oct. 4 — ROATAN — 8 days, Go Mexico, Inc., Minneapolis, Minn.  
 Oct. 5, 19 — COZUMEL — 8 days, Go Mexico, Inc., Minneapolis, Minn.  
 Oct. 9, 24 — BIMINI — 7 days, Tropic Diving Cruises Inc., Ft. Lauderdale, Fla.  
 Oct. 9 — GUAM, PALAU, SAIPAN — 11 days, Innerspace Adventures, Pearl City, Hawaii.  
 Oct. 11 — AQABA, JORDAN — 15 days, John Clark, See & Sea Travel, San Francisco, Calif.  
 Oct. 11 — COZUMEL — 8 days, See & Sea Travel, San Francisco, Calif.  
 Oct. 14 — BARRIER REEF MEXICO — 11 days, Windjammer Cruises, Inc., Miami Beach, Fla.

Oct. 14 — TORTOLA, BVI — 13 days, Trimarine Misty Law, St. Thomas, Virgin Islands  
 Oct. 18 — CAYMAN ISLANDS — 8 days, See & Sea Travel, San Francisco, Calif.  
 Oct. 18 — BONAIRE — 9 days, See & Sea Travel, San Francisco, Calif.  
 Oct. 19 — BELIZE — 7 days, Go Mexico, Inc., Minneapolis, Minn.  
 Oct. 19 — KONA, LANAI, MAUI, OAHU — 10 days, Innerspace Adventures, Pearl City, Hawaii.  
 Oct. 19 — KONA, PONAPE — 20 days, Innerspace Adv., Pearl City, Hawaii.  
 Oct. 21 — AUSTRALIA/CORAL SEA — 17 days, Al Giddings, See & Sea, San Francisco, Calif.  
 Oct. 24 — COZUMEL — 8 days, Sunland Int'l Tours, Beverly Hills, Calif.  
 Oct. 27 — CABO SAN LUCAS — 5 days, Sunland Int'l Tours, Beverly Hills, Calif.  
 Oct. 28 — PONAPE, TRUK — 11 days, Innerspace Adventures, Pearl City, Hawaii.  
 Oct. 28 — PONAPE, SAIPAN — 20 days, Innerspace Adv., Pearl City, Hawaii.  
 Oct. 30 — TRUK, GUAM, PALAU — 16 days, Innerspace Adventures, Pearl City, Hawaii.  
 Nov. 1, 15, 29 — BAHAMAS — 7 days, Tropic Diving Cruises Inc., Ft. Lauderdale, Fla.  
 Nov. 1, 22 — ROATAN — 8 days, Go Mexico, Inc., Minneapolis, Minn.  
 Nov. 2, 23 — COZUMEL — 8 days, Go Mexico, Inc., Minneapolis, Minn.  
 Nov. 6, 13, 20, 27 — KONA, HAWAII — aboard Fair Wind, See & Sea Travel, San Francisco, Calif.  
 Nov. 6 — GUAM, PALAU, SAIPAN — 11 days, Innerspace Adventures, Pearl City, Hawaii.  
 Nov. 7, 14, 21, 28 — BONAIRE — 8 days, Lisind Int'l, New York, N.Y.  
 Nov. 8, 17 — BIMINI — 7 days, Tropic Diving Cruises Inc., Ft. Lauderdale, Fla.  
 Nov. 8, 22 — CAYMAN ISLANDS — 8 days, See & Sea Travel, San Francisco, Calif.

Nov. 8, 22 — SAN ANDRES — 8 days, Go Mexico, Inc., Minneapolis, Minn.  
 Nov. 9, 23 — BELIZE — 7 days, Go Mexico, Inc., Minneapolis, Minn.  
 Nov. 14 — ST. THOMAS — 7 days, Happy Wanderer, Bronxville, N.Y.  
 Nov. 21 — COZUMEL — 8 days, Sunland Int'l Tours, Beverly Hills, Calif.  
 Nov. 22 — STELLA MARIS — 9 days, Scuba Tours, Fairfax, Va.  
 Nov. 22 — COZUMEL — 8 days, Les Newport, See & Sea Travel, San Francisco, Calif.  
 Nov. 23 — KONA, LANAI, MAUI, OAHU — 10 days, Innerspace Adventures, Pearl City, Hawaii.  
 Nov. 23 — HAWAII, TRUK, PONAPE — 20 days, Innerspace Adv., Pearl City, Hawaii.  
 Nov. 24 — CABO SAN LUCAS — 8 days, Sunland Int'l Tours, Beverly Hills, Calif.  
 Nov. 29 — JAMAICA — 7 days, Elmer's Watersports, Inc., Evanston, Ill.  
 Dec. 2 — PONAPE, TRUK — 11 days, Innerspace Adventures, Pearl City, Hawaii.  
 Dec. 1, 12, 21 — BIMINI — 7 days, Tropic Diving Cruises Inc., Ft. Lauderdale, Fla.  
 Dec. 2 — PONAPE, SAIPAN — 20 days, Innerspace Adv., Pearl City, Hawaii.  
 Dec. 4 — TRUK, GUAM, PALAU — 16 days, Innerspace Adventures, Pearl City, Hawaii.  
 Dec. 4, 11, 18, 25 — KONA, HAWAII — aboard Fair Wind, See & Sea Travel, San Francisco, Calif.  
 Dec. 5, 12, 19, 26 — BONAIRE — 8 days, Lisind Int'l, New York, N.Y.  
 Dec. 6, 20, 27 — SAN ANDRES — 8 days, Go Mexico, Inc., Minneapolis, Minn.  
 Dec. 7, 21, 28 — COZUMEL — 8 days, Go Mexico, Inc., Minneapolis, Minn.  
 Dec. 11 — GUAM, PALAU, SAIPAN — 11 days, Innerspace Adv., Pearl City, Hawaii.  
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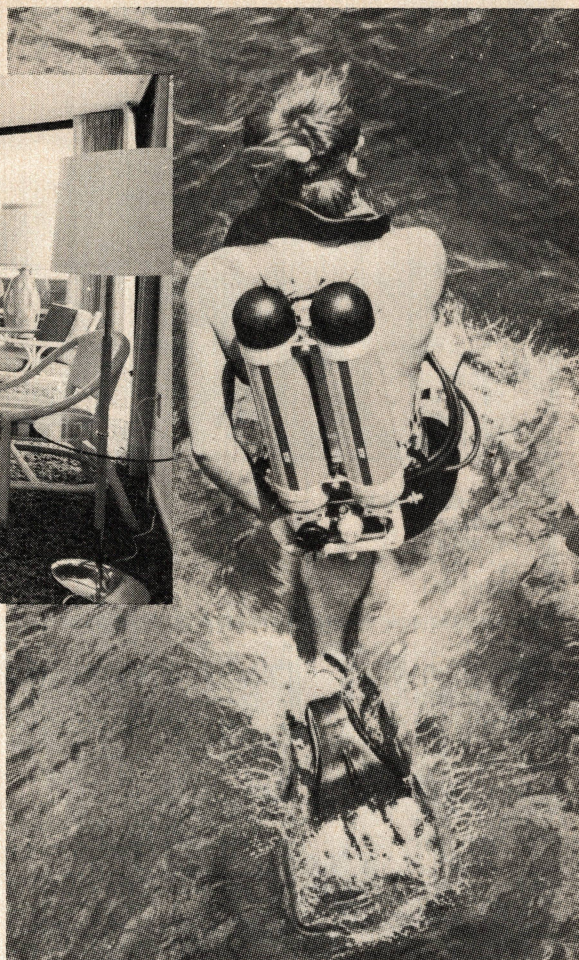
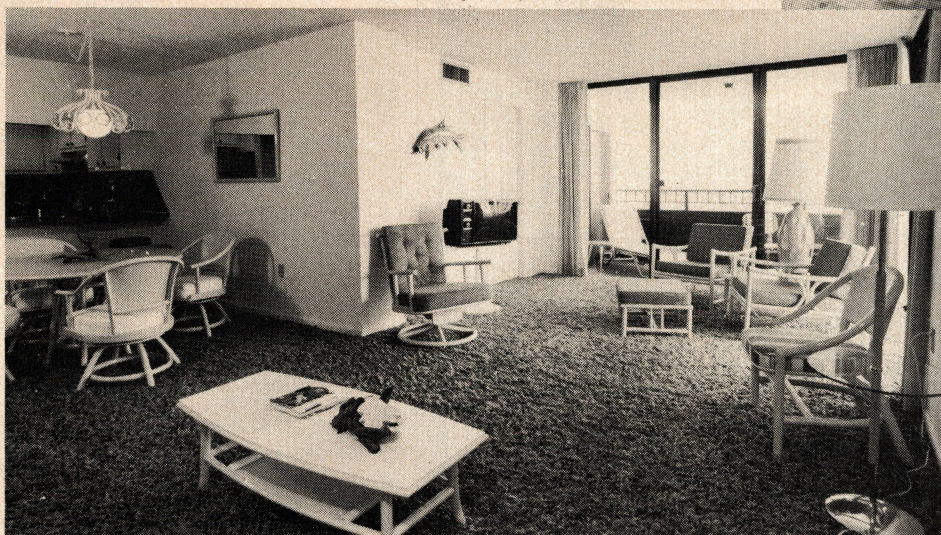
For more information and prices on diving at Stella Maris  
 Write to Jorg — Divemaster/Owner

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### ...packaged just for divers! \$400/week for up to 6 people

This includes a beautiful and completely furnished vacation home (Check in at 2 pm on Saturday and check out at 10 am the following Saturday); 6 reef trips per unit for Certified divers (28-foot Sport Diver Enterprise)...or...a week of instruction for certification at Hall's, a PADI training facility; free air; picked up and returned at Hawks Nest; free use of Hawks Nest 17-foot outboards (Boston Whalers) or the catamaran sailboats; swimming pool, outdoor gas barbeques; game room; shelling. And the Florida lobster season is on for divers and snorklers!

Hawks Nest is a 5-story, 28-unit interval ownership complex of vacation homes nestled at the foot of 7-Mile Bridge in Marathon. Each vacation home has a wide balcony with a sweeping view of either the Gulf of Mexico or the Atlantic Ocean.



When you vacation at Hawks Nest, you automatically qualify for the "love it or leave it" plan. This simply means that, should you wish to buy a vacation home, your entire \$400 is credited against the purchase price (as low as \$1,400) with mortgages available at 7% interest.

This is a vacation package for Certified divers (offer open thru December 15) and entails no other commitments whatsoever. There is direct plane service via Air Sunshine from Tampa and Miami with car rentals available at the Marathon Airport.

Please reserve me a vacation home for \_\_\_\_\_ people starting Saturday, \_\_\_\_\_ 1975. Enclosed is my check ☐ money order ☐ in the amount of \$100.00.

☐ Please send me additional information on the "diver's vacation package" at Hawks Nest.

Hawks Nest  
number one kyle way south  
Marathon, Florida 33050

Name \_\_\_\_\_

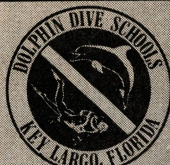
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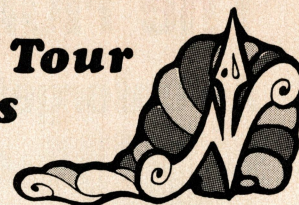


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## Dive Tour News



- Dec. 13—ROATAN—8 days, Go Mexico, Inc., Minneapolis, Minn.
- Dec. 14, 21, 28—BELIZE—7 days, Go Mexico, Inc., Minneapolis, Minn.
- Dec. 20 — CAYMAN ISLANDS — 10 days, Christmas special, See & Sea, San Francisco, Calif.
- Dec. 20 — COZUMEL — 10 days, Christmas special, See & Sea Travel, San Francisco, Calif.
- Dec. 25 — KONA, HAWAII — 7 days on Fairwind, The Dive Shop, Leawood, Kan.
- Dec. 26 — BONAIRE — 8 days, Happy Wanderer, Bronxville, N.Y.
- Jan. 3, 12, 23 — BIMINI — 7 days, Tropic Diving Cruises, Ft. Lauderdale, Fla.
- Jan. 4 — GRAND CAYMAN — 10 days, Sierra Club, San Francisco, Calif.
- Feb. 13 — BONAIRE — 8 days, Happy Wanderer, Bronxville, N.Y.
- Mar. 5 — BERMUDA — 8 days, Happy Wanderer, Bronxville, N.Y.
- Apr. 9 — BONAIRE — 7 days, Scuba Tours, Fairfax, Virginia.
- May 6 — GALAPAGOS ISLANDS — 24 days, Sierra Club, San Francisco, Calif.
- June 4, 16 — GRAND CAYMAN — 12 days, Sierra Club, San Francisco, Calif.
- June 19 — BELIZE BARRIER REEF — 14 days, Sierra Club, San Francisco, Calif.
- July 7 — FIJI & TONGA — 20 days, Sierra Club, San Francisco, Calif.
- July 8 — VIRGIN ISLANDS — 12 days, Sierra Club, San Francisco, Calif.
- Aug. 2 — KONA COAST, HAWAII — 12 days, Sierra Club, San Francisco, Calif.
- Aug. 12 — LANAI & MAUI — 12 days, Sierra Club, San Francisco, Calif.
- Aug. 15 — N. CALIFORNIA COAST — 7 days, Sierra Club, San Francisco, Calif.

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For further information, contact: Great Harbour Bay Sailing Club, Great Harbour Cay, P.O. Box N1324, Nassau, Bahamas.



## STAN WATERMAN TO LEAD SEE & SEA GALAPAGOS TRIP

Master cinematographer and film producer Stan Waterman will lead See & Sea Travel Inc.'s March 10 diving cruise to the fabled Galapagos Islands.

This is See & Sea's fourth year of offering full scale diving expeditions to these amazing islands six hundred miles off the coast of Ecuador (see *SKIN DIVER*, Feb. 1974). Here, where Charles Darwin first observed the evolutionary oddities which matured into his *Origin of Species*, divers thrill to marine iguanas, sea lions, flightless cormorants, penguins and other undersea wonders. Between dives land excursions view frigate birds, giant tortoises, boobies, albatross and many other species at close range.

Stan Waterman, famed for his filmed adventures around the world, is a frequent lecturer at film festivals and a delightful story-teller. After his recent filming of white sharks for *Blue Water, White Death* and *Jaws* he has many new stories to tell.

For further information on this diving adventure to the enchanted seas of the Galapagos contact See & Sea Travel Service, Suite 340, 680 Beach St., San Francisco, Calif. 94109. (415) 771-0077.

## TV PERSONALITY LEADS CAYMAN CRUISE

See & Sea Travel is pleased to have Jerry Jensen, well-known television news commentator of KGO-TV in San Francisco, escorting a special pre-Christmas Cayman Islands diving cruise December 13-20.

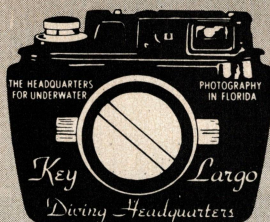
Jerry Jensen is an experienced and well-traveled diver, and a member of the reporting team which telecasts the na-



tional and international news each evening to a large San Francisco area audience. Jerry's filmed reports of his previous diving adventures aboard the *Cayman Diver* have awakened major interest in this exciting diving destination among his Northern California viewers.

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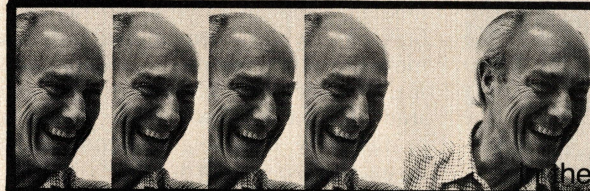
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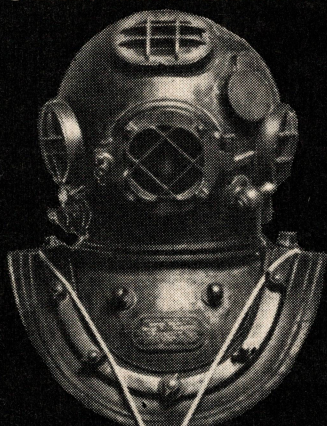
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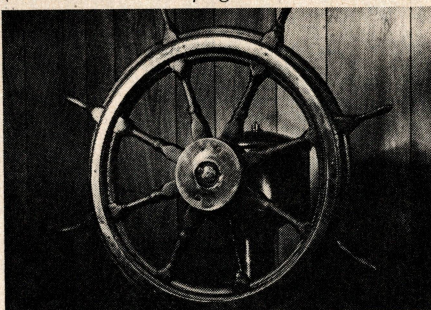
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## MYSTERY WRECK

(Continued from page 53)



not help feeling a nagging suspicion that this identification would not be considered positive by others until some object bearing a reliable inscription could be recovered. The final solution to the problem appeared to be below.

The last two divers, the mates of the *Sea Lion*, Bill Hoodiman and Bob Archambault, geared up and grabbed a large bow saw equipped with a metal cutting blade. Slipping over the side, they swam to the tightly-stretched decompression line and began their descent. After reaching the helm, Bill immediately began sawing the two-inch brass shaft while Bob examined the stand more closely. It seemed as if Gary and I, in our forced haste, had missed four large studs that passed through the stand and bridge deck, their retaining nuts drawn up against the ceiling of the level below.

Realizing what had to be done, Bob dropped over the side into the deeper darkness of the lower bridge, searching for the door that would lead him to the interior of the rusting superstructure. Swimming along the deteriorated walls of the outside companionway, he soon found and entered the gaping mouth of the bridge doorway. After what must have seemed like an eternity in the silt-filled room, he located the nearly-invisible studs and began unbolting the remaining four nuts. In a short time he finished and emerged to rejoin Bill, who had just completed cutting through the shaft. Together they proceeded to rock the heavy unit back and forth until it fell over on the deck, free at last. Approaching the absolute limit of their remaining air, they were forced to leave. With one last effort before he started the climb upwards, Bob attached and inflated a 100 kilo lift bag to the helm.

Once aboard the *Sea Lion*, Bill told Gary and me that the helm was loose and ready to be lifted. Methodically we geared up, knowing well that what we had to accomplish must be done on a bounce dive, for a repetitive dive after our short surface interval would be out of the question. We planned our dive carefully, for down below we would have to work quickly and accurately in order to raise an object of this size in the dark. One mistake on our part and this invaluable artifact could plummet to the ocean floor and be lost for all time. Carrying the hope of the entire crew with us, we again

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began the long, dismal descent to the bridge of the wreck.

The bulbous form of Bob's grossly-extended lift bag was the first sight to greet us as we settled alongside the toppled helm, now lying like some strange, fallen idol. We wasted no time in finishing the job at hand. While Gary cut the old, rotting decompression and fishing lines off the helm, I tied another 200 pound lift bag to the stand and started to force air into the tightly compressed vinyl bag. Working in the pitch dark by touch alone, I could sense the bag taking shape and exerting an upward force. When the bag finally filled to capacity, the entire unit began to rise slowly off the deck, as if it were reluctant to break the bonds that had held it captive for so long. We backed off to the farthest corner of the bridge, away from the maddeningly-slow-ascending helm in case one of the bags should burst and release the heavy weight to crash upon us.

Gary had tied his decompression line to the wheel before it had started toward the surface, as insurance against the historic treasure developing trouble and returning irretrievably to the sand. Out of our sight now, the expanding bags sped their valuable cargo through the lighter layers of water, while below the decompression line spun wildly in Gary's hands as the line peeled off at a fantastic rate. Abruptly, the revolving reel came to a halt. We looked at one another with a sense of relief, cut the safety line, tied it to a railing, and began the final swim toward the surface.

The next hour was a backbreaking time for all on board as the lines were manned and muscles strained in an attempt to pull the heavy, awkward artifact into the rocking boat without damaging the fragile spokes of the teakwood wheel. Seemingly, nothing could go wrong on this day for the chore was accomplished with a minimum of difficulty and, most importantly, no damage. Once on board and lashed down, we carefully cleaned off the stand, revealing the manufacturer's legend, "Robert Roger & Co., Stockton on Tees," inscribed on the cap. Irrefutable proof was before our eyes. The vessel lying beneath our keel was the *I. P. Goulandris*, formerly the British steamer *Eggesford*, built at Stockton, England, in 1910.

On the ride home we languished in a heady glow of accomplishment. Due to a remarkable team effort we had completed a difficult job under the worst possible conditions, and in some small way we had furthered the historical study of the wrecks of the Jersey Coast. The restored helm was donated to the Maritime Museum in Philadelphia for all to see.

After the excitement had died down and things had returned to normal, a question began to form in my mind, one that would give me no rest in the days ahead: Where was the grave of the Chilean freighter *Choapa* . . .

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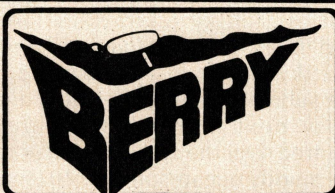
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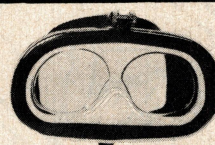


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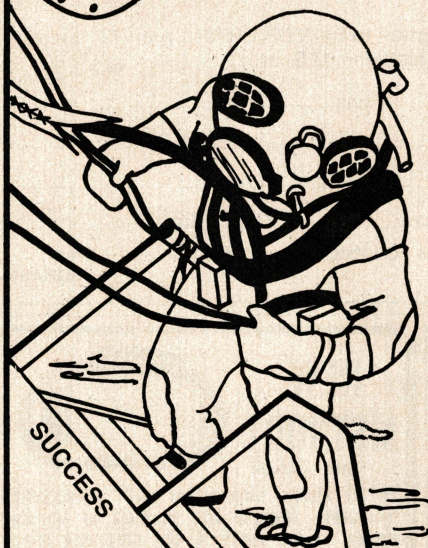
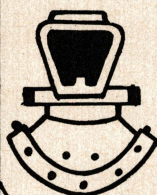
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## Bio Briefs Unsung Heroes of Diving

by  
E. R. CROSS

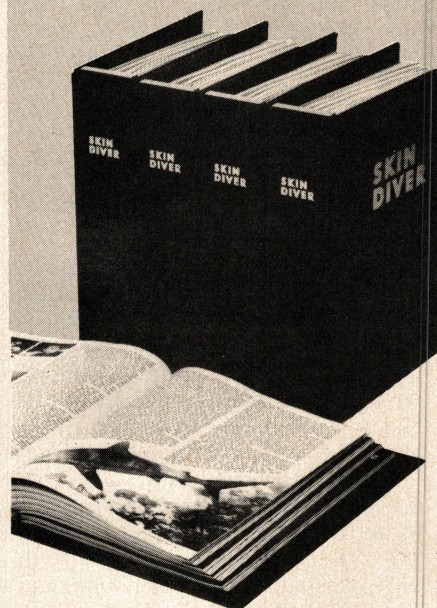
MARTIN CONRAD SIBITSKY

Because of the men and women in the field of diving who dared to try the untried, who had the courage to venture into the unknown, we today have the finest diving technology in the world. This series of Bio Briefs of famous divers is intended to pay tribute to the men and women in military, commercial, and sport diving throughout the world whose skill, courage, and ability have set the pace for all others to follow.

The United States submarine *Squalus* should never have sunk in the first place. It was on a simple routine test dive in quiet waters with no other ships in sight. As it dived, red and green lights blinked on and off in the control room indicating valves were properly closed or opened as required. But two main air induction valves just behind the conning tower were not closed, even though the green lights indicating "closed" were shining brightly. One of these air induction valves was 31 inches in diameter; the other 18 inches. When the sub slid beneath the surface, tons of water poured through the spouting openings into the after part of the *Squalus* and carried her to the bottom in 240 feet of water. Survival of any of the crew in such a submarine disaster would be doubtful. Rescue of any who survived would be totally improbable. But 33 men in the forward part of the boat did survive. And thanks to some of the world's best divers they were rescued. The man fellow divers said had the toughest of all jobs in that rescue was diver Martin Conrad Sibitsky, then a boatswain's mate in the United States Navy.

Martin Sibitsky was working in his yard a few miles from the New London submarine base. A police car screeched to a halt as Sibitsky raked fall's last leaves into piles. Within five minutes, diver Sibitsky was on his way back to his ship the submarine rescue vessel *Falcon*. By early next morning the *Falcon* lay moored over the stricken *Squalus* mired in the muddy ocean bottom 240 feet below. From then on it was one on one — one man against one deep, cold sea. On the outcome of this unequal contest hung the lives of 33 men trapped far below in the dark of a flooded submarine. Every minute was precious time if these men were to be rescued. It was imperative that Sibitsky make good on his first attempt at hooking up the down-haul cable of the submarine rescue bell.

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Today 240 feet doesn't sound like such a great depth. In 1939 there were fewer than a dozen men in the world who had ever been at that depth. Sibitsky was one of the few U.S. Navy divers who had. His record of successful dives said he was the man most likely to succeed in getting to the sub and securing the rescue cable — on the first try.

Now let the log of the rescue vessel tell the story of the drama that unfolded 36 years ago . . .

U.S.S. *FALCON* — Off Isle Of Shoals, Portsmouth, N.H. 24 May 1939.

0646 — Ship completed mooring over the sunken submarine *Squalus*.

1014 — Sibitsky, Martin Conrad, BM2c, USN, left surface to secure rescue bell down-haul cable to *Squalus*.

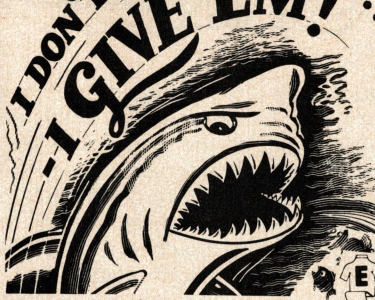
1017 — Diver reached bottom and attached down-haul cable.

1039 — Diver left bottom. Time of dive 25 minutes.

1124 — Diver reached surface and entered decompression chamber for surface decompression. Sibitsky made the following statement:

"I was dressed in on the deck of the *Falcon*. Then I was hoisted over the starboard side. I checked my suit for leaks. When satisfied that all was o.k., I had the crew move me forward to the descending line. This was a small manila rope that was attached to a large grapnel hook that had snagged some unknown part of the *Squalus*. Then I signaled to start down. I went down fast. Soon I knew I was getting deep because I could feel the descending line take a sharper angle. I stopped my descent and had topside take more of a strain on the line. I checked with the telephone talker, 'How much air hose do I have out?'. The answer came back, 'Two hundred feet.' I started down again. Soon I felt my feet strike something and slide off. Then suddenly I landed jarringly on something solid. I dropped to my knees. I had landed on the ship's deck grating and reported. 'On the *Squalus*.' I looked around and saw the anchor windless. I knew where I was now. I had landed on her bow just inboard of her port rail and just forward of her forward mast. I was facing forward. The rescue hatch should be behind me and to my right. I turned and started toward it. I reported this and asked for the rescue bell down-haul cable be sent down to me. While waiting for the cable I checked the rescue hatch for obstructions that would keep the rescue bell from seating with a watertight seal. The broken telephone cable from the *Squalus* was laying directly across the hatch. I tried to pull it up from the dark ocean bottom below but it was fouled. I tried to cut it with my knife but the cable was too tough. Finally I worked some slack into the cable and tied it around a stanchion a few feet from the rescue hatch. A I finished, the rescue bell down-haul cable came sliding down my air hose and

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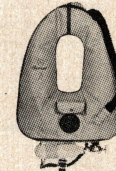


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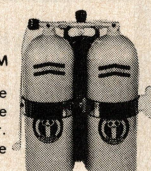
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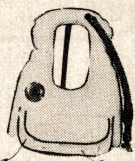
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## Bio Briefs

Unsung Heroes of Diving

struck me in the stomach. I eased back to the rescue hatch to shackle in the wire."

Far above on the surface the sea was making up and *Falcon* began to roll in the ocean swells. Sibitsky could feel his air hose and lifeline working with the roll of the ship. As he reached to shackle the wire into the rescue hatch bail, the *Falcon* took a wild roll and yanked the cable from his cold hands. Sibitsky reported this to topside crews via telephone. Sibitsky went on with his report. "It seemed the cable was back in just a few minutes. This time I made sure I had a good hold on the wire and shackled it into the bail. When finished I stood up. I reported over the telephone, 'Ready to come up'. I felt my lines tighten. Then I was off the *Squalus* and on my way to the surface."

Sibitsky reached the surface at 1124 and was placed in the decompression chamber for surface decompression. Just six minutes later, at 1130, the McCann rescue bell was hoisted over the side and lowered to the *Squalus* via the down-haul wire which had been attached to the rescue hatch bail by Sibitsky. Before Sibitsky had completed his surface decompression, the first of the rescued crewmen was standing on the deck of the *Falcon* looking into the chamber at Sibitsky. Eventually all 33 men who had survived the sinking of the submarine were rescued.

But the work of the divers had just started. Now the *Squalus* had to be raised to the surface and drydocked to remove the dead and for inspection. Four grueling months later the job was done.

In the months prior to the *Squalus* disaster the U.S. Navy had been experimenting with oxy-helium breathing mixes for deep diving. At the time the *Squalus* sank, no working dives had yet been made nor were they planned for some time. Due to the extreme depth of the submarine, and the trouble the divers were having working at this depth on compressed air, the heliox rig and gas were brought to the *Falcon* and readied for work. On May 27, 1939, the first working dive on a heliox mix was made.

Sibitsky, working with a dozen other highly skilled and trained men, made many dives during the salvage of the *Squalus*. Most of these perilous trips to the deep ocean bottom were to depths of 240 feet. Entanglement in sweep wires, bone crushing contact with giant salvage pontoons, strong currents, and the numbing cold were their lot. In late September, 1939, the submarine *Squalus* was dry docked and gave up her dead. When one remembers two other tragic

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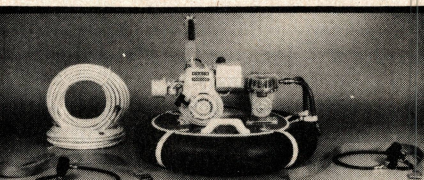
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submarine disasters in the next few days of 1939 (the British submarine *Thetis* in British waters and the French submarine that sank the same month in Asiatic waters) and in previous years the S-4 and the S-51, and before those the R-2 and F-4, it is realized what little chance of escape or rescue and salvage there was for the crew and their boat, *Squalus*. Three things made this fantastic rescue and salvage possible; the McCann rescue chamber, oxy-helium diving rigs, and the ability, guts, and tenacity of Sibitsky.

For his heroic work in the rescue of the men of the *Squalus* and subsequent salvage of the boat he was awarded the United States Congressional Medal of Honor. An award he and five other divers more than earned in this submarine rescue and salvage operation.

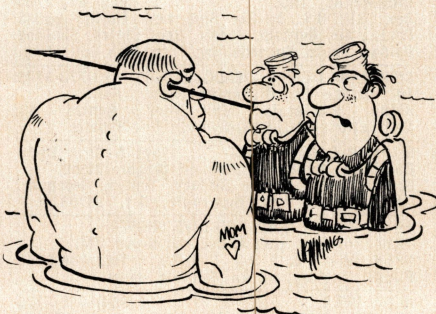
## USA NEWS

Delegates from the member councils at their meeting on May 1 and 2 of the Underwater Society of America announced a new, reorganized, Underwater Society of America.

Russ Thompson, the new president of the Society, said "Changes in the Constitution of the Society now, for the first time, allow membership and voting rights for all dues paying members of the diving community in all parts of the community — sport divers, club members, independents, instructors, manufacturers, retailing and other divers of special interest."

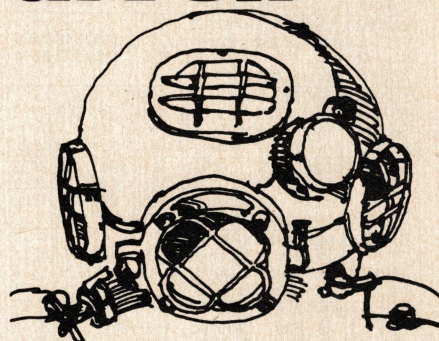
"This, along with important new programs in diver interest, club formation, national competitive programs (including underwater hockey), new international diving location guide, insurance program, NOGI awards, and legislation (Divers In Government — DIG) really establish a new Society," said Harry Shanks, Administrative Director of the Society. He went on to say that "the Society's endorsement and sanction of the Our World — Underwater Scholarship is a significant point in the new society for the society through its newsletters to clubs and member councils can forward the information on this scholarship open to all young people in diving."

The society welcomes all inquiries about the new society to their headquarters at 1701 Lake Avenue, Glenview, Illinois 60025.



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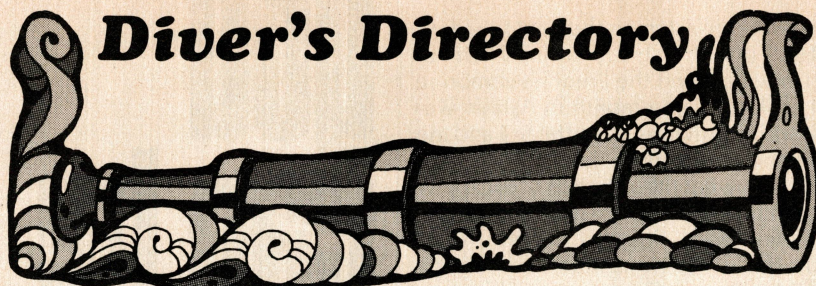
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(continued on next page)



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(continued from preceding page)

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## OUR WORLD — UNDERWATER SCHOLARSHIP

Applications are being accepted for the third Our World — Underwater Scholarship which will be awarded on May 1, 1976. This \$5000 annual scholarship is one of the most unique of its type in the United States.

The scholarship, which covers a year in duration, offers the winner many experiences with leading oceanographers, limnologists, and explorers all over the world. The form of the scholarship is active participation in field studies comprised of a series of exposures in specialized areas of underwater research and endeavors. It is made up of expeditions, research trips, laboratory and photographic assignments, underwater equipment testing and manufacturing.

This year's winner, Robert M. Adams of Saint Paul, Minnesota, will participate in research programs at Applied Science Associates with Robert Smith in Miami, Florida; two weeks at Bethesda Naval Medical Research Institute in Bethesda, Maryland; three weeks at U.C.L.A. with Dr. Glen Egstrom — among other programs of study are time with Dr. George Bond at Panama City, Florida; Dr. John Warne at Rice University; the Commercial Diving Center of Wilmington, California; Brooks Institute of Photography; and six weeks with Dr. Ted Bank II in Unalaska and the Aleutians. Similar programs are being developed for the winner of the third scholarship.

As an offshoot to the main scholarship, all finalists and semi-finalists are also eligible for mini-scholarships and experiences. Douglas Zinn, 1975 first finalist will be along with Bob Adams on the Bethesda program and most of the west coast programs. Neal Shapiro, 1975 second finalist will join Bob and Doug on the Unalaska trip. Other assignments and experiences which the recipient cannot fill due to conflicts in schedules, will be offered to other semi-finalists. The scholarship is open to any high school senior or college student (undergraduate or graduate) who meets the following requirements: A. Male or female over 18 years and under 25 years of age; B. Certified diver with national certification (and a statement from instructor or school regarding proficiency); C. High academic standing; D. A complete application with all requirements, letters of recommendations, etc., fully completed and submitted to the committee prior to midnight of December 31, 1975.

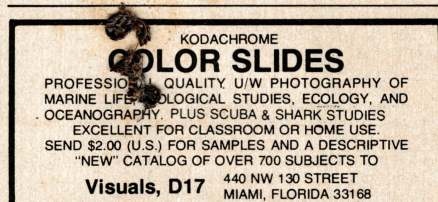
The scholarship will be awarded by the Our World — Underwater Scholarship Committee on the basis of the applications submitted. The committee consists of Dr. Joseph MacInnis, Chairman; Joyce Markstahler, Co-ordinator; Dr. Arthur Bachrach; Dr. Glen Egstrom; Al

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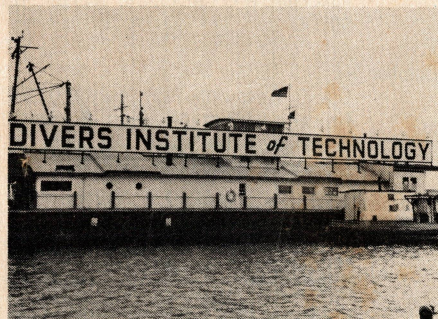


Giddings; Harry Shanks; Dr. Lee Somers; Paul Tzimoulis; Mike Wagner; Dr. John Warme; Mark V. Bensen, the first scholarship recipient; and Robert Adams, the second scholarship recipient.

Application forms and instructions can be procured by writing to Our World — Underwater Scholarship, P.O. Box 643, Wheaton, IL 60187.

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pace and divers today require new skills and talents as compared to their counterparts a few years ago. Changing manpower needs in the diving industry require better-trained men and with this in mind, the Divers Institute of Technology has developed an additional advanced course that will be offered.

Jack Bisplinghoff, President of DIT has advised SKIN DIVER that the new expanded program will offer an additional 330 hours (11 weeks) of advanced training. Some of the new instruction will include advanced underwater cutting and welding (two additional weeks), advanced scuba training, new offshore oil training, three weeks of saturation theory and techniques, scuba instructor certification plus other new subjects.

Students may enroll in the 14-week course and then go into the advanced program if they desire. The new course will also be offered as a separate, 25 week program at 30 hours per week for a total of 750 hours.

DIT has already started a waiting list for their new program and they hope to commence the first class in the very near future. The new program is approved by the Washington State Council for Occupational Education for Veteran Training and it is accredited by NATTS, the National Association of Trade and Technical Schools. Students who enroll in the six-month course may apply for financial assistance through Basic Educational Opportunity Grant Program.

We urge anyone who is interested in commercial diving as a career to write to Divers Institute of Technology at 1133 NW 45th Street, Seattle, Washington 98107, and ask for further details.

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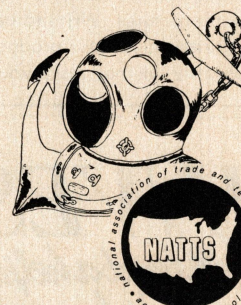
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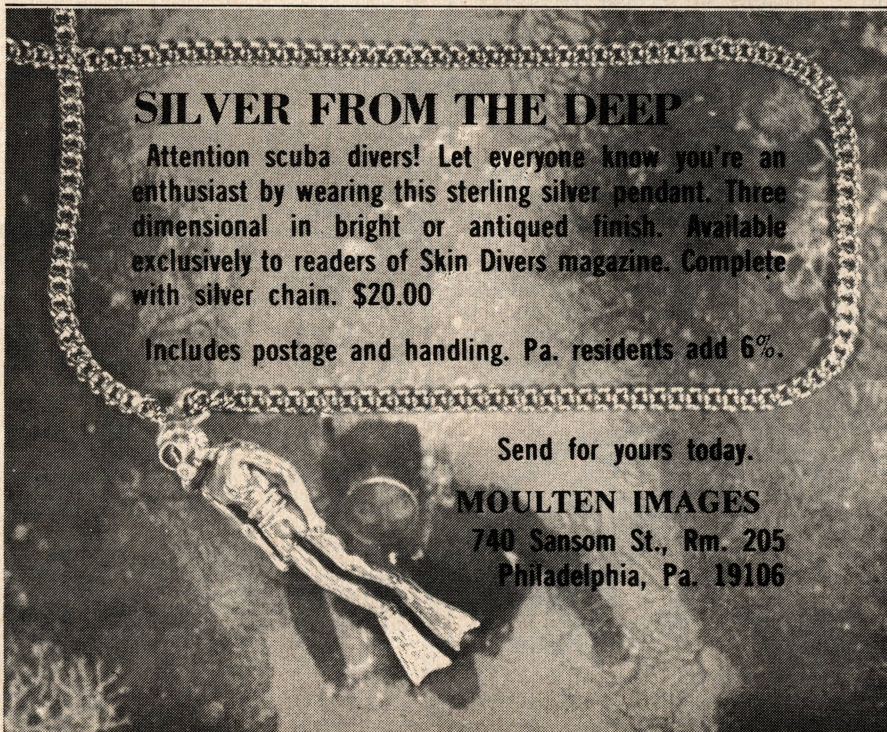
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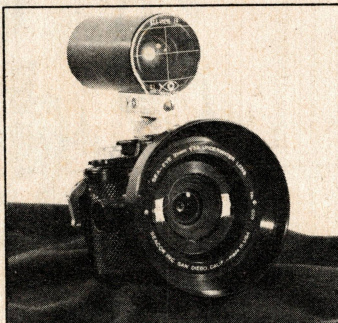
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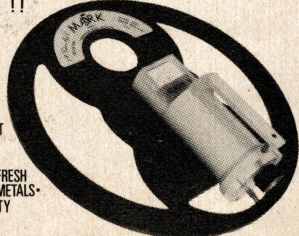
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October 1

13th Annual International Underwater Photo Competition. (Contact: Underwater Photographic Society, P.O. Box 7088, Van Nuys, CA 91409)

October 1-31

Advanced Methods in Underwater Research, USC Marine Science Center, Catalina Island. (Contact: Dr. Robert Given, USC Santa Catalina Marine Biological Lab, P.O. Box 398, Avalon, CA 90704)

October 3-4

Oct. 3, Freshwater Film Festival; Oct. 4, Chicago. (Contact: John G. Shedd Aquarium, 1200 South Lake Shore Dr., Chicago, IL 60605)

October 4-5

North Atlantic Underwater Convention, Rockport, Mass. (Contact: NAUI Hdqrs., 22809 Barton Rd., Colton, Ca. 92324 [714] 783-1862)

October 11

Seamark '75, New England Aquarium. (Contact: Phil Holt, P.O. Box 216, Gloucester, Mass. 01930)

October 15

7th Annual Innerspace Pacifica Photo Competition entry deadline. (Contact: William Reed, 98-1465 Kaonohi St., Aiea, Hawaii 96701)

November 6-7

Innerspace Pacifica '75 Film Festival & Int'l Film Festival. (Contact: Bill Reed, 98-1465 Kaonohi St., Aiea, Hawaii 96701)

November 8

3rd Underwater Paleontology and Archaeology Seminar, Daytona Beach, Fla. (Contact: Ormond Anchor Chasers Inc., Box 1934, Ormond Beach, Fla. 32074)

November 8-9

Film Festival, Honolulu, Hawaii. (Contact: NAUI Hdqrs., 22809 Barton Rd., Colton, Ca. 92324 [714] 783-1862)

January 24-25

Innerspace Odyssey—Frontiers in Diving, Gainesville, Fla. (Contact: Barnacle Busters Divers, P.O. Box 12823, University Station, Gainesville, Fla. 32604)

April 2

North Atlantic Diving Councils Convention, Harvard University, Boston, Mass. (Contact: Wayne Anderson, P.O. Box 908, Hyannis, Mass. 02601)

May 5-7

6th Annual Our World—Underwater Seminar, Symposium and Film Festival, Sheraton Chicago Hotel and Medinah Temple. (Contact: Joyce Markstahler, P.O. Box 643, Wheaton, Ill. 60187 [312] 286-8142)



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